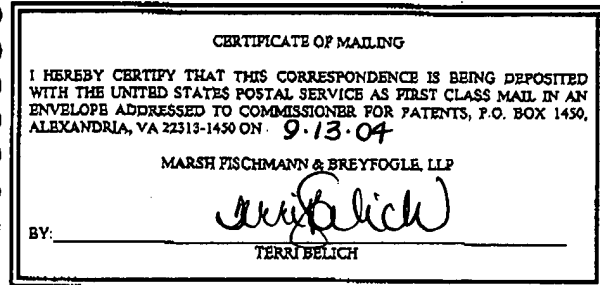


PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of: ) Group Art Unit: 2663  
SRINIVASAN )  
Serial No.: 09/433,497 )  
Filed: November 3, 1999 )  
Confirmation No.: 2641 )  
Atty. File No.: 1613 (42059-00970) )  
For: "Intelligent Call Routing System" )



DECLARATION UNDER 37 CFR 1.131

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313

Dear Sir:

1. I, Kenneth J. Johnson, PTO Registration No. 36,834, am the Patent Attorney who received instructions from the assignee's predecessor, U.S. West Communications, Inc., to prepare and file a U.S. Patent Application on an invention entitled, "INTELLIGENT CALL ROUTING SYSTEM," invented by Thiru Srinivasan.

2. This matter was designated by U.S. West Communications, Inc. as Docket No. 1613 and by one of my previous law firms, Holme Roberts & Owen LLP, as Matter No. 42059-0970.

3. This matter has been transferred to and is being handled by another one of my previous law firms, Marsh Fischmann & Breyfogle LLP, under the same Matter No. 42059-00970.

4. In April 1999, while at Holme Roberts & Owen LLP, I received an invention disclosure (that was signed by the inventor on October 26, 1998, witnessed on that date and on October 28, 1998 and received by the U.S. West Communications' Law Department on October 30, 1998) from the U.S. West Communications' Law Department for this invention, which was entitled at that time, "INTELLIGENT CALL ROUTING SYSTEM," along with a cover letter dated April 9, 1999. See Attachments at Tabs 1 and 2.

5. As can be appreciated, the invention disclosure was witnessed by two witnesses and is dated prior to the November 2, 1998 filing date of the patent application that resulted in U.S. Patent No. 6,240,449 (Nadeau).

6. I prepared a patent application based on the invention disclosed in the invention disclosure and on August 4, 1999, I mailed a cover letter attaching a draft of a patent application on our client's invention to the inventor, Thiru Srinivasan, based on his earlier-received invention disclosure. See Attachments at Tabs 3 and 4.

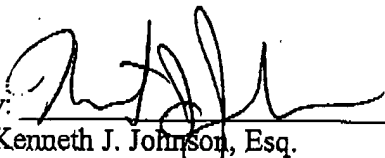
7. Sometime after that, I received feedback from the inventor and, based thereon, prepared another draft which I sent to the inventor for review on October 8, 1999. See Attachment at Tab 5.

8. On November 3, 1999, I filed the present patent application with the U.S. Patent and Trademark Office, and the application was assigned U.S. Pat. App. No. 09/433,497.

9. The undersigned Patent Attorney acknowledges that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. 1001) and may jeopardize the validity of the application or any patent issuing thereon. All statements made of the undersigned's own knowledge are true and all statements made on information and belief are believed to be true.

This Declaration is signed by the undersigned Patent Attorney on the date reflected below.

Respectfully submitted,

By:   
Kenneth J. Johnson, Esq.  
Registration No. 36,834

Date: 9/13/04

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U S WEST, Inc.  
1801 California Street  
Suite 5100  
Denver, Colorado 80202  
Telephone 303 672-2968  
Facsimile 303 308-9456



Rhonda M. Hardesty  
Legal Secretary

April 9, 1999

Ken Johnson, Esq.  
Holme Roberts & Owen  
1700 Lincoln Street  
Suite 4100  
Denver, Colorado 80203

Re: U S WEST Invention Disclosure for Case 1613  
Patent Application Preparation

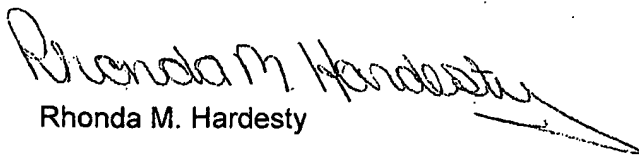
Dear Ken:

Enclosed is a copy of an invention disclosure and associated documents for which U S WEST would like Holme, Roberts & Owens to prepare and file an application. The particulars are as follows:

Our Case: 1613  
Title: INTELLIGENT CALL ROUTING SYSTEM  
Inventor(s): Thiru Srinivasan  
U S WEST Entity: U S WEST Communication/Information Technologies  
Deposit Acct. No.: 21-0456  
U S WEST Attorney: Pete Kinsella  
Client Billing Code: ITS-0049

Please let me know if you need anything further.

Very truly yours,

  
Rhonda M. Hardesty

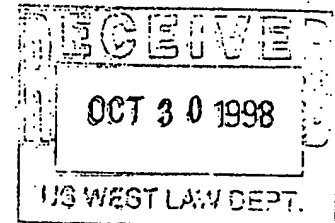
Enclosure



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Law Department Use Only	
Docket No.	1613
Date Rec'd	10/30/98
USW Entity	CMITS
Rec'd by (init.)	SM

## INVENTION DISCLOSURE



### DIRECTIONS

Complete EVERY ITEM. If any item is not applicable or unknown, please indicate.

All inventors should sign the form (Item 14), as well as two witnesses (Item 15) and your supervisor (Item 16).

Send the completed, ORIGINAL form to the U S WEST Law Department - Intellectual Property Group, 7800 East Orchard Road, Suite 490, Englewood, CO 80111. You may FAX the form (FAX No. 303-793-6563), but please also send the original. If you have any questions, contact the Law Department at 303-793-6276 or 303-796-6030.

This document is available in electronic form on the file server at U S WEST Advanced Technologies, Inc. or in hard copy form from the Law Department. A sample completed form is also available from the Law Department.

Since patent rights can be lost by public disclosure, please keep your invention confidential until advised otherwise by the Law Department.

\*\*\*\*\*

(1) Invention Title. Give a short (10 words or less) descriptive title of the invention.

Intelligent Call Routing system.

(2) Invention Summary. State what you regard as the key invention concept (30 words or less).

A system that allows routing of voice, fax, pager, data, and video calls and e-mail to subscribers of Portals and Directory Providers based on time-of-day, day-of-week, and date.

(3) Purpose and Problems Solved. Briefly state why the invention was developed, what problems it solves and the advantages it has over existing products or processes.

The invention was developed for the following reasons:

- To relieve the switch-based telephone network of the burden of routing calls based on time-of-day, day-of-week, and date.
- To relieve the Customer Premises Equipment (CPE) of the burden of routing calls based on time-of-day, day-of-week, and date.
- To avoid terminating a call on a switch before being forwarded to the final destination based on time-of-day, day-of-week, and day. This type of call setup will tie up the facilities unnecessarily.
- To relieve both the switch-based and CPE-based subscribers of the service of the burden of programming the service via touch-tone inputs.
- To allow subscribers to subscribe to the service using the Internet from around the world.
- To facilitate the means to reach a subscriber who may be traveling outside his/her normal place of residence.
- To facilitate the means to reach a subscriber at his/her normal place of residence.
- To allow subscribers to be reached anywhere and anytime.
- To allow the subscribers of Portals, such as Yahoo! and Netscape, and Directory Providers, such as U S WEST Dex, SBC, and NYNEX, to create and update the routing profile over the Internet in a user-friendly manner.
- To allow subscribers to notify the would-be callers that the pagers have been turned off so that the callers may use alternative means to reach the subscribers.

The following problems are found to exist with the available products/services:

1. U S WEST and a host of other telephone companies offer time-of-day, day-of-week, and date routing of telephone calls based on an architecture called Advanced Intelligent Networks (AIN). The subscriber may be allowed to program, via touch-tone inputs, the routing of calls to phone numbers based on time-of-day, day-of-week, and date. But, it is very unfriendly and time consuming to listen to the voice prompts and program the Intelligent Peripheral (IP - an adjunct much like a Voice Response Unit [VRU]). In order to activate the service, the AIN software must be run in the switches (for example, SESS, DMS, etc.) and Service Control Point (SCP). The call travels to the destination switch, which detects an AIN trigger, sends a query to the SCP, and forwards the call to the final Destination Address indicated by the SCP's response. Overall, it is very costly to maintain services based on a telephone network. An IP may not allow the subscriber to program the routing criteria for an unlimited number of paths (for example, unlimited number of time intervals [for a given day] such as 12:01 am to 1:00 am, 1:01 am to 8:00 am, 8:01 am to 11:00 am, 11:01 am to 12 mid night, and so on).



2. A CPE (like a Private Branch eXchange [PBX]) may be programmed to offer time-of-day, day-of-week, and date based routing of telephone calls. Again, the CPE needs to be programmed for each extension. The VRU, which is part of the CPE, also needs to be programmed to accept touch-tone inputs to allow the extension owners to set up their routing profiles. Although using a CPE relieves one to move away from switch-based services, it still has a number of drawbacks similar to those of the AIN-based service.
3. Both the AIN-based and the CPE-based services apply only to telephone calls. They do not apply to calls made via paging, desktop data conferencing, and desktop video conferencing, as well as communication via e-mail. Moreover, subscribers sign up for the service on an individual basis for each of the devices. Telephone companies do not offer any discount for including multiple devices as part of a service package. In addition, creating the services in the SCP is a time consuming task.
4. Callers do not get a confirmation of the receipt of the page. It will be very useful for the callers to know whether the pager carried by a subscriber is ON or OFF.

The following advantages may be found with the system described in this invention disclosure:

- It is cost prohibitive to upgrade and maintain the switches, SCPs, and IPs to run an AIN-based network in order to offer the service.
- Instead of the terminating switch detecting an AIN trigger to determine the final destination number (thus tying up the facilities), the final Destination Address is determined at the time of originating the call.
- Because there is a huge installed base of subscribers, it is cost-effective to program and maintain over the Internet the call routing profiles of subscribers of Portals and Directory Providers.
- No additional toll charges due to redirection (other than reaching the subscriber at his/her normal phone number) are incurred.
- An unlimited number of routing paths may be programmed.
- For calls made from telephone-to-telephone and PC-to-telephone, an AIN-based terminating switch may be programmed to use the Intelligent Call Routing database because it allows an unlimited number of routing paths. Therefore, there is no need for companies to install the SCP and the IP to offer this service.
- Companies that install telephony gateways for PC-to-PC, PC-to-telephone, and telephone-to-telephone communications may use the Intelligent Call Routing database for routing decisions.

- Time zones, days, and dates in the country where the call must be completed are handled transparently.
  - Subscribers may turn off their pagers per a configurable schedule and be able to inform the would-be callers of their unavailability via pagers during such configured time intervals.
  - The system may also be used for Intranet-based directory services.
- (4) Description. Describe the invention and/or attach a description, drawing(s), flow chart(s) and/or diagram(s), if available.

APPENDIX 1 is a pictorial representation of what constitutes the system in the form of Java-based GUI screens that a subscriber uses to create and update the routing criteria for each of the devices he/she owns.

APPENDIX 2 gives a detailed description of the Intelligent Call Routing database that carries the routing and time zone information.

Portals, such as Netscape, Excite, Yahoo!, and AOL, and telephone companies, such as U S WEST, SBC, and NYNEX, publish electronic White and Yellow pages containing the name, address, telephone number(s), and e-mail of the subscribers. Callers may connect with the subscribers by a PC-to-telephone or PC-to-PC call described by the patent application DirectoryTalk (Case # 1500).

The process of administering the routing criteria for the different devices owned by the subscriber is explained below:

A process known as ADMIN\_PROCESS running in the server hosting the database allows the subscriber to program the Portal/Directory Provider database with Destination Address(s) for each icon (for example, Home Phone, Work Phone, Cellular Phone, and Work Fax) based on time-of-day, day-of-week, and day of the subscriber. Note that the subscriber can be from around the world as in the case of Netscape Netcenter. In this case, the Netcenter database will have a BROWSER\_PROCESS (explained below) that will determine, by retrieving from the Intelligent Call Routing database, the actual Destination Address to be called when a caller selects the corresponding icon. This Destination Address will be selected based on the routing algorithm set up by the subscriber (using the ADMIN\_PROCESS) and, finally, the process will complete the call to it.

For example, the subscriber may be an Indian national. Naturally, he/she will program the Destination Address(s) according to the Indian Standard Time (IST), which is 11 1/2 hours ahead of MDT. The BROWSER\_PROCESS running in Netcenter (the Netcenter server may be running in CA, USA) will determine the local time in India and, accordingly choose the Destination Address that matches the subscriber's criterion for completing the call.

The process of making a call to the subscriber is explained below:

First, a caller does a search on the web site of the Portal or Directory Provider for a particular subscriber based on name, city, telephone number, zip code, and/or e-mail address. Second, he/she will select the icon belonging to a particular type of device (i.e. Home Phone, Work Phone, Cellular Phone, and Work Fax) owned by the subscriber. The BROWSER\_PROCESS running in the server hosting the database receives the icon selected (Icon Type) and retrieves from the database the final Destination Address based on the routing criteria administered by the subscriber and, finally completes the call to that device (Destination Address Type).

The following tables are used by the system:

- The SUBSCRIBER table stores subscriber related information.
- The DATE table specifies the routing criteria based on the date(s) established by the subscriber. The data in this table relate to the schedule of a subscriber who will be available outside his/her normal place of residence.
- The TIME\_OF\_DAY table specifies the routing criteria based on the days and time-of-day(s) established by the subscriber. The data in this table relate to the subscriber's availability at his/her normal place of residence.
- The PAGER table specifies the scheduled times that the subscribers cannot be reached via pagers.
- The TIME\_ZONE table specifies the time in hours and minutes that the server is either ahead of or behind each country's time zone(s).

Because the Portal and Directory Provider servers may run anywhere in the world, the following logic is used in routing a call when the caller selects an icon (representing a device owned by the subscriber) as described in the DirectoryTalk patent application. Note that the application talks about a hidden Icon Address behind each type of device the subscriber owns. The type of device (shown as an icon that the caller may click) is referred here as the Icon Type.

- Any date-based routing will have the highest preference. Date-based routing is used for purposes of reaching the subscriber when he/she is traveling outside the normal place of residence. The logic works as follows:

Compute the actual date in the country (from the TIME\_ZONE table and the server date) of the subscriber based on the subscriber time zone;

If the Icon Address, Icon Type, and computed date are found in the DATE table, then  
Complete the call to the specified Destination Address in the table entry;

If there is no match in the DATE table, go to time-of-day based routing as explained below.

- Any day and time-of-day based routing will have a lower preference than date-based routing. The logic works as follows:

Compute the actual day in the country (from the TIME\_ZONE table and the server day) of the subscriber based on the subscriber time zone;

Compute the local time (from the TIME\_ZONE table and the server time) based on the time zone specified for the subscriber;

If the Icon Address, Icon Type, computed day, and computed time are found in the TIME\_OF\_DAY table, then

Complete the call to the specified Destination Address in the TIME\_OF\_DAY table;

If there is no match in the TIME\_OF\_DAY table, go to pager-based routing as explained below:

- Any pager-based routing will have the lowest preference. The logic works as follows:

If the Icon Address, Icon Type, computed day, and computed time are found in the PAGER table, then {

Send an error message to the caller (for PC-to-PC and PC-to-telephone calls over the Internet using the browser) or the entity (which may be an AIN-based switch or a telephony gateway that will translate the error message into a voice prompt indicating the subscriber's unavailability);

} Else

Complete the call to the specified Icon Address;

Traditional telephone companies (such as U S WEST and SBC) that establish communications to the subscriber via telephone-to-telephone, PC-to-telephone, and PC-to-PC may program the terminating AIN-based switch to retrieve from the Intelligent Call Routing database (done by provisioning the called number at the switch with the web site of the server hosting the database) the Destination Address by sending a query containing the called telephone number and the country to which the called telephone number belongs (this is because a telephone number like 303-896-1000 may belong to two or more countries and the database is common to all subscribers from around the world). A process known as the PSTN\_PROCESS (Public Switched Telephone Network Process) running in the server hosting the database will do a database retrieval to extract the Destination Address to which the call must be routed by the switch and, send the Destination Address in a response message to the switch which will complete the call.

Internet telephony providers who establish communications to the subscriber via telephone-to-telephone, PC-to-telephone, and PC-to-PC using their telephony gateways, may program the gateways to retrieve from the Intelligent Call Routing database the Destination Address by sending a query containing the called telephone number and the country. A process known as IP\_TELEPHONY\_PROCESS running in the server hosting the database will do a database retrieval to extract the Destination Address to which the call must be routed by the telephony gateway and, send the Destination Address in a response message to the telephony gateway which will complete the call.

It should be noted that APPENDIX 1 shows GUI screens only for good scenarios. The system can be extended by creating GUI screens for bad responses. The application may also be extended to include time-of-day based routing as part of the DATE table.

(5) Business Area. Check the business area that best fits your invention.

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> Network Services   | <input type="checkbox"/> Multimedia/Video          | <input type="checkbox"/> Speech Recognition |
| <input type="checkbox"/> Network Operations | <input type="checkbox"/> Digital Signal Processing | <input type="checkbox"/> Voice Messaging    |
| <input type="checkbox"/> AIN                | <input type="checkbox"/> Wireless                  | <input type="checkbox"/> ISDN               |
| <input type="checkbox"/> Info. Management   | <input type="checkbox"/> Broadband                 | <input checked="" type="checkbox"/> Other:  |

\_\_\_White & Yellow Pages\_\_\_

(6) Responsible U S WEST Entity. Provide the name of the U S WEST Division/Subsidiary having responsibility for the invention. This is usually the organization in which the inventor (or majority of inventors) is employed.

I.T./U S WEST, Inc.

(7) U S WEST Project Name or No.

- a. Under what U S WEST project name or number was work done which resulted in the invention?

Interconnect Mediated Access (IMA) - GUI400E0

- b. If the project was funded by organization(s) other than the responsible organization in Item 6 above, please name that organization(s).

Not applicable.

(8) Conception Date. When was the invention first conceived? Please list any records (engineering notebook, memos, etc.) which establish such conception.

September 25, 1998.

(9) Prototype or Model. Has a prototype/model been built? If so, when was it built and where is it now?

No.

(10) Related Items. Are there any existing products, processes, patents or U S WEST invention disclosures similar or which may relate to the invention? If so, please list them.

- DirectoryTalk (Case # 1500) patent application filed by Thiru Srinivasan.
- Several AIN patents, including one issued to U S WEST bearing the number 5,754,630 (inventor is Thiru Srinivasan) and one still pending (case # 1220) with the U S Patent Office filed by Thiru Srinivasan.

(11) Sale or Public Use. Has this invention been sold, offered for sale or publicly used (field trial, etc.) or is such sale or use anticipated? If so, please supply actual or anticipated dates.

No.

(12) Publication or Disclosure. Has the invention been disclosed in a publication or disclosed to anyone outside U S WEST or is such disclosure or publication anticipated? If so, supply actual or anticipated dates.

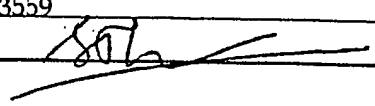
No.

(13) Commercial Value. Briefly outline the potential commercial value of the invention (e.g., likelihood of use by others, licensing potential, etc.).

This service may be offered free of charge. However, it is the caller who pays for the call to the Portal, Directory Provider, or Internet telephony gateway provider. Therefore, it is essential that the caller has a registered account with the Portal, Directory Provider, or Internet telephony gateway provider. The charges may be billed to either a pre-paid calling card or a credit card. In fact, both types of billing mechanisms are used by Portals such as Yahoo!, Excite, and Netscape (Contact(SM) in alliance with Qwest, Inc.) to charge the callers.

In order to gain market share, U S WEST Dex may allow new subscribers (other than those who are on the electronic White and Yellow Pages in the 14 states) from around the world to register (again, free of charge) at uswest.com, much like what Yahoo!, Excite, and Netscape have done.

(14) INVENTOR SIGNATURES

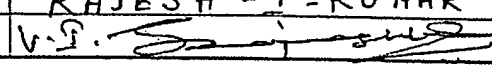
First Inventor (print first, MI, last)	THIRU SRINIVASAN	Citizenship	INDIA
Home Address	9675 S. RED OAKES PLACE, HIGHLANDS RANCH, CO 80126		
USW Subsidiary/Div.	I.T.		
Work Address	1005 17 <sup>th</sup> STREET, SUITE 1090, DENVER, CO 80202		
Work Phone	303-896-3559	Fax	303-965-8936
Signature		Date	10-26-98

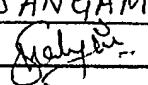
Second Inventor (print first, MI, last)		Citizenship	
Home Address			
USW Subsidiary/Div.			
Work Address			
Work Phone		Fax	
Signature		Date	

(attach more pages if required)

(15) WITNESS SIGNATURES

Read and understood:

Witness #1 (print name)	RAJESH - T - KUNAR		
Signature		Date	10-26-1998

Witness #2 (print name)	SANGAMESH S KALYANI		
Signature		Date	10/28/98

(16) SUPERVISOR SIGNATURE

Supervisor (print name)	ROB MITCHELL		
Signature		Date	

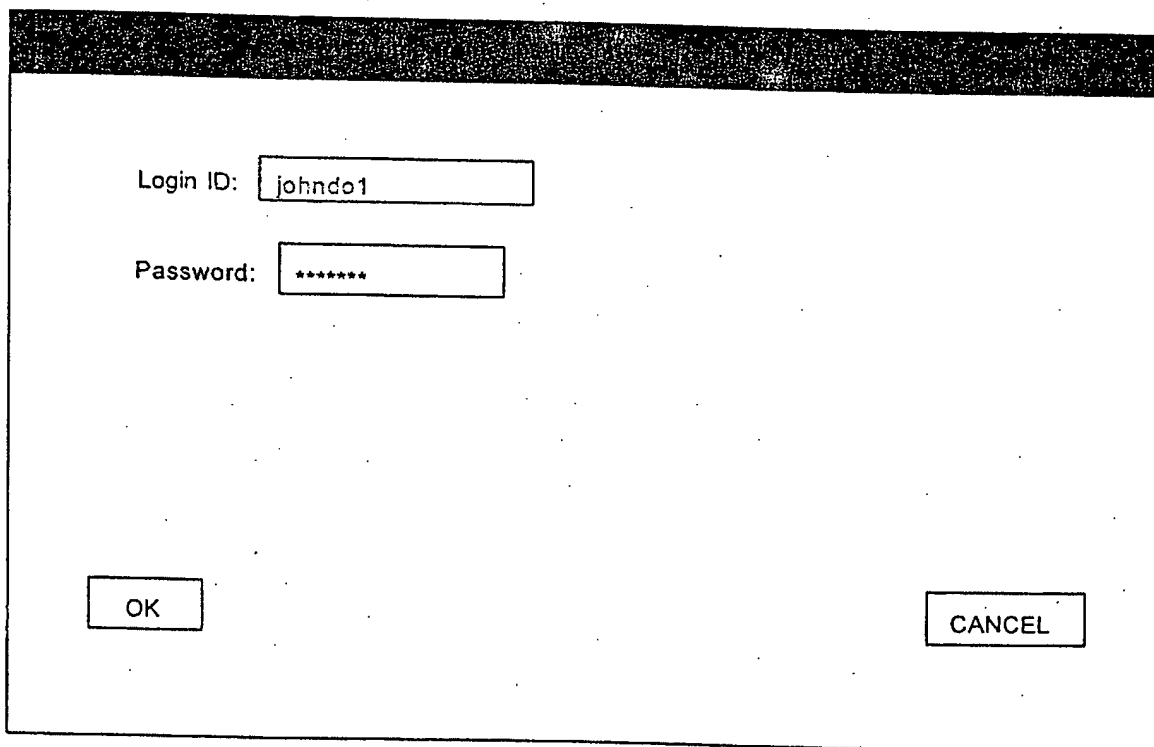


## APPENDIX 1

APPENDIX 1 is a pictorial representation of what constitutes the Intelligent Call Routing (an application written in Java) system in the form of GUI screens. The subscriber logs on to the web site hosted by the Portal or Directory Provider and invokes the Intelligent Call Routing system in order to set up routing criteria for the different devices he/she owns.

### Welcome to the Intelligent Call Routing system screen

This screen is the main screen for entry into the Intelligent Call Routing system. It is used to authorize the subscriber of the Portal or Directory Provider.



Login ID: johndo1

Password: \*\*\*\*\*

OK CANCEL

## Components - Welcome to the Intelligent Call Routing system screen

The following matrix describes the fields and buttons that are included on the "Welcome to the Intelligent Call Routing system" screen.

Seq.	Field	Field Type	Required/ Conditional/ Optional	Default Value	Field Length/ Char.	Valid Values	Comments
1	Login ID	Editable	Required		7 A/N		
2	Password	Editable	Required		7 A/N		
3	OK	Selection button					
4	CANCEL	Selection button					

## Behavior - Welcome to the Intelligent Call Routing system screen










The following events describe the expected behavior of the "Welcome to the Intelligent Call Routing system" screen.

Event Name	Basic Course	System Behavior
"OK" button is clicked	Launch "Intelligent Call Routing System Functions" screen.	Verify login identity from the SUBSCRIBER table and download the Java application.
"CANCEL" button is clicked	Terminate the session.	

## Intelligent Call Routing System Functions screen

This screen lets the subscriber invoke the system functions.

This screen is shown after the subscriber logs into the system via the "Welcome to the Intelligent Call Routing system" screen.

Subscriber Name:	<input type="text" value="John Doe1"/>																
Subscriber Country:	<input type="text" value="USA"/>																
Time Zone:	<input type="text" value="MDT"/>																
Icon Type & Icon Address:	<table border="1"><tr><td>Work Phone - (1) 303-896-1000</td><td></td></tr><tr><td>Home Phone - (1) 303-788-1000</td><td></td></tr><tr><td>Numeric Pager - (1) 303-821-7889</td><td></td></tr><tr><td>Toll-free Number - (1) 1-800-345-2222</td><td></td></tr><tr><td>Cellular Phone - (1) 303-435-5565</td><td></td></tr><tr><td>Voice Mail - (1) 303-896-3333</td><td></td></tr><tr><td>Video Phone - (1) 303-896-4444</td><td></td></tr><tr><td>E-mail - jdoe1@abcinc.com</td><td></td></tr></table>	Work Phone - (1) 303-896-1000		Home Phone - (1) 303-788-1000		Numeric Pager - (1) 303-821-7889		Toll-free Number - (1) 1-800-345-2222		Cellular Phone - (1) 303-435-5565		Voice Mail - (1) 303-896-3333		Video Phone - (1) 303-896-4444		E-mail - jdoe1@abcinc.com	
Work Phone - (1) 303-896-1000																	
Home Phone - (1) 303-788-1000																	
Numeric Pager - (1) 303-821-7889																	
Toll-free Number - (1) 1-800-345-2222																	
Cellular Phone - (1) 303-435-5565																	
Voice Mail - (1) 303-896-3333																	
Video Phone - (1) 303-896-4444																	
E-mail - jdoe1@abcinc.com																	
<input type="button" value="Enter Pager Unavailability Schedule"/>																	
<input type="button" value="Enter Date-based Routing"/>	<input type="button" value="Enter Time-of-day based Routing"/>																
<input type="button" value="Exit System"/>																	

### Components - Intelligent Call Routing System Functions screen

The following matrix describes the fields and buttons that are included on the "Intelligent Call Routing System Functions" screen.

Seq.	Field	Field Type	Required/ Conditional/ Optional	Default Value	Field Length/ Char.	Valid Values	Comments
1	Subscriber Name	Display only	Required		20 A/N		Retrieve value from SUBSCRIBER table based on Login ID.
2	Subscriber Country	Display only	Required		20 A/N		Retrieve value from SUBSCRIBER table based on Login ID.
3	Time Zone	Display only	Required		3 A		Retrieve value from SUBSCRIBER table based on Login ID.
The following field will repeat for each device the subscriber owns.							
4	Icon Type & Icon Address	Selection Box	Required		47 A/N (26 chars. for Icon Type and 20 chars. For Icon Address)	Format is "Icon Type - Icon Address".  Valid Values of Icon Type: Home Phone, Work Phone, Cellular Phone, Video Phone, Toll-free Number, Home Fax, Work Fax, Desktop Data Conferencing, Desktop Video Conferencing, Numeric Pager, Alpha-numeric Pager, Numeric Sky Pager, Alpha-numeric Sky Pager, Voice Mail, 500-Number, E-mail	Retrieve each of the Icon Type and the associated Icon Address values from SUBSCRIBER table based on Login ID, concatenate the values with a dash in between and, display it in a selection box.
5	Enter Date-based Routing	Selection button					
6	Enter Time-of-day based Routing	Selection button					
7	Enter Pager Unavailability Schedule	Selection button					
8	Exit System	Selection button					

### Behavior - Intelligent Call Routing System Functions screen

The following events describe the expected behavior of the "Intelligent Call Routing System Functions" screen.

Event Name	Basic Course	System Behavior
"Icon Type & Icon Address" field is selected		Highlight the selection..
"Enter Date-based Routing" button is clicked	Launch "Enter Date-based Routing" screen.	Value selected for Icon Type & Icon Address are carried over to the "Enter Date-based Routing" screen.
"Enter Time-of-day based	Launch "Enter Time-of-day based Routing" screen.	Value selected for Icon Type & Icon Address and the values

Event Name	Basic Course	System Behavior
Routing" button is clicked		for Subscriber Country and Time Zone are carried over to the "Enter Time-of-day based Routing" screen.
"Enter Pager Unavailability Schedule" button is clicked	Launch "Enter Pager Unavailability Schedule" screen.	Value selected for Icon Type & Icon Address and the values for Subscriber Country and Time Zone are carried over to the "Enter Pager Unavailability Schedule" screen.
"Exit System" button is clicked	Terminate the session.	

## Enter Date-based Routing screen







This screen allows the subscriber to add date-based routing of calls to the database. It is assumed that the dates entered by the subscriber reflect his/her availability away from the normal place of residence. In other words, the subscriber is assumed to be traveling outside (either within the subscriber's home country or in a foreign country) the normal place of residence on the date(s) entered.

This screen is shown after the subscriber selects the "Enter Date-based Routing" button on the "Intelligent Call Routing System Functions" screen.

Icon Type:

Icon Address:

Routing Table Section:

Travel Date	Visiting Country	Visiting Country Time Zone	Destination Address	Destination Address Type
10/15/1998	USA	EST 	201-741-1000	Home Phone 
		CST		Work Phone
		MST		Cellular Phone
		PST		Voice Mail
		HST		
10/16/1998	USA	EST 	201-695-1230	Home Phone 
		CST		Work Phone
		MST		Cellular Phone
		PST		Voice Mail
		HST		
10/30/1998	France	FST 	12-345-3456	Home Phone 
				Work Phone
				Cellular Phone
				Voice Mail

OK

Add a Row

CANCEL

## Components - Enter Date-based Routing screen

The following matrix describes the fields and buttons that are included on the "Enter Date-based Routing" screen.

Seq.	Field	Field Type	Required/Conditional/Optional	Default Value	Field Length/Char.	Valid Values	Comments
1	Icon Type	Display only	Required		26 A/N	Home Phone, Work Phone, Cellular Phone, Video Phone, Toll-free Number, Home Fax, Work Fax, Desktop Data Conferencing, Desktop Video Conferencing, Numeric Pager, Alpha-numeric Pager, Numeric Sky Pager, Alpha-numeric Sky Pager, Voice Mail, 500-Number, E-mail	Value carried over from the "Intelligent Call Routing System Functions" screen.
2	Icon Address	Display only	Required		20 A/N		Value carried over from the "Intelligent Call Routing System Functions" screen.
<b>Routing Table Section:</b> The following 5 fields may repeat. Any entries present in the DATE table will be displayed when the screen is launched.							
3	Travel Date	Editable	Required		10 A/N	MM/DD/YYYY	The system will ensure that the Travel Date entered is within a 6 month period.
4	Visiting Country	Pull-down menu	Required		50 A/N	All countries in the world.	
5	Visiting Country Time Zone	Pull-down menu	Required		3 A	Depends on Visiting Country selected.	
6	Destination Address	Editable	Required		20 A/N		
7	Destination Address Type	Pull-down menu	Required		26 A/N	Home Phone, Work Phone, Cellular Phone, Video Phone, Toll-free Number, Home Fax, Work Fax, Desktop Data Conferencing, Desktop Video Conferencing, Numeric Pager, Alpha-numeric Pager, Numeric Sky Pager, Alpha-numeric Sky Pager, Voice Mail, 500-Number, E-mail	<p>If Icon Type = Home Phone, then Destination Address Type will be a list of Home Phone, Work Phone, Cellular Phone, 500-number, and Voice Mail.</p> <p>If Icon Type = Work Phone, then Destination Address Type will be a list of Home Phone, Work Phone, Cellular Phone, 500-number, and Voice Mail.</p> <p>If Icon Type = Cellular Phone, then Destination Address Type will be a list of Home Phone, Work Phone, Cellular Phone, 500-number, and Voice Mail.</p> <p>If Icon Type = Video Phone, then Destination</p>

Seq.	Field	Field Type	Required/Conditional/Optional	Default Value	Field Length/Char	Valid Values	Comments
							<p>Address Type will be a list of Voice Mail and Video Phone.</p> <p>If Icon Type = Toll-free Number, then Destination Address Type will be defaulted to Toll-free Number.</p> <p>If Icon Type = Home Fax, then Destination Address Type will be a list of Home Fax, and Work Fax.</p> <p>If Icon Type = Work Fax, then Destination Address Type will be a list of Home Fax, and Work Fax.</p> <p>If Icon Type = Desktop Data Conferencing, then Destination Address Type will be defaulted to Desktop Data Conferencing.</p> <p>If Icon Type = Desktop Video Conferencing, then Destination Address Type will be defaulted to Desktop Video Conferencing.</p> <p>If Icon Type = Numeric Pager, then Destination Address Type will be defaulted to Numeric Pager.</p> <p>If Icon Type = Alpha-numeric Pager, then Destination Address Type will be defaulted to Alpha-numeric Pager.</p> <p>If Icon Type = Numeric Sky Pager, then Destination Address Type will be defaulted to Numeric Sky Pager.</p> <p>If Icon Type = Alpha-numeric Sky Pager, then Destination Address Type will be defaulted to Alpha-numeric Sky Pager.</p> <p>If Icon Type = Voice Mail, then Destination</p>



Seq.	Field	Field Type	Required/Conditional/Optional	Default Value	Field Length/Char.	Valid Values	Comments
							<p>Address Type will be a list of Home Phone, Work Phone, Cellular Phone, 500-number, and Voice Mail.</p> <p>If Icon Type = 500-number, then Destination Address Type will be a list of Home Phone, Work Phone, Cellular Phone, 500-number, and Voice Mail.</p> <p>If Icon Type = E-mail, then Destination Address Type will be defaulted to E-mail.</p>
8	Add a Row	Selection button					
9	SUBMIT	Selection button					
10	CANCEL	Selection button					

## Behavior - Enter Date-based Routing screen

The following events describe the expected behavior of the "Enter Date-based Routing" screen.

Event Name	Basic Course	System Behavior
"Add a Row" button is clicked		The Java applet will add a blank row to the table under the "Routing Table Section". The fields will preserve their characteristics e.g., pull-down menu capabilities.
"SUBMIT" button is clicked	Launch "Result of Information Entered" screen.	Add routing information to the DATE table for the Icon Address and Icon Type based on the Login ID.
"CANCEL" button is clicked	Launch "Intelligent Call Routing System Functions" screen.	

## Enter Time-of-day based Routing screen

This screen allows the subscriber to add information to the database relating to time-of-day based routing of calls.

This screen is shown after the user selects the "Enter Time-of-day based Routing" button on the "Intelligent Call Routing System Functions" screen.

Subscriber Country:

Icon Type:

Time Zone:

Icon Address:

**Routing Table Section:**

Day		Time Interval	Destination Address	Destination Address Type
Sunday	<input checked="" type="checkbox"/>	12:01 AM - 12 Mid Night	303-896-3333	Home Phone <input checked="" type="checkbox"/>
Monday	<input type="checkbox"/>			Work Phone <input type="checkbox"/>
Tuesday	<input type="checkbox"/>			Cellular Phone <input type="checkbox"/>
Wednesday	<input type="checkbox"/>			Voice Mail <input type="checkbox"/>
Thursday	<input type="checkbox"/>			
Sunday	<input checked="" type="checkbox"/>	12:01 AM - 8 AM	303-896-3333	Home Phone <input checked="" type="checkbox"/>
Monday	<input type="checkbox"/>			Work Phone <input type="checkbox"/>
Tuesday	<input type="checkbox"/>			Cellular Phone <input type="checkbox"/>
Wednesday	<input type="checkbox"/>			Voice Mail <input type="checkbox"/>
Thursday	<input type="checkbox"/>			

THIS IS FOR THE PERSON WITH THE SUNDAY SCHEDULE BY PAGE 12

## Components - Enter Time-of-day based Routing screen

The following matrix describes the fields and buttons that are included on the "Enter Time-of-day based Routing" screen.

Seq.	Field	Field Type	Required/ Conditional/ Optional	Default Value	Field Length/ Char.	Valid Values	Comments
1	Subscriber Country	Display only	Required		20 A/N		Value carried over from the "Intelligent Call Routing System Functions" screen.
2	Time Zone	Display only	Required		3 A		Value carried over from the "Intelligent Call Routing System Functions" screen.
3	Icon Type	Display only	Required		26 A/N	Home Phone, Work Phone, Cellular Phone, Video Phone, Toll-free Number, Home Fax, Work Fax, Desktop Data Conferencing, Desktop Video Conferencing, Numeric Pager, Alpha-numeric Pager, Numeric Sky Pager, Alpha-numeric Sky Pager, Voice Mail, 500-Number, E-mail	Value carried over from the "Intelligent Call Routing System Functions" screen.
4	Icon Address	Display only	Required		20 A/N		Value carried over from the "Intelligent Call Routing System Functions" screen.
<b>Routing Table Section.</b> The following 4 fields will repeat at least 7 times, once for each of the 7 days in a week. If the Time Interval for a Day does not cover 24 hours, then the 4 fields will repeat until the 24 hours for the Day are accounted for. Any entries already present in the TIME_OF_DAY table will be displayed when the screen is launched.							
5	Day	Pull-down menu	Required		9 A	Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday	
6	Time Interval	Editable	Required		26 A/N	HH:MM AM[PM] - HH:MM AM[PM][Mid Night]	
7	Destination Address	Editable	Required		20 A/N		The Country Code (from TIME_ZONE table) of the Subscriber will added in the front of the Destination Address before the record is inserted into the database.
8	Destination Address Type	Pull-down menu	Required		26 A/N	Home Phone, Work Phone, Cellular Phone, Video Phone, Toll-free Number, Home Fax, Work Fax, Desktop Data Conferencing, Desktop Video Conferencing,	If Icon Type = Home Phone, then Destination Address Type will be a list of Home Phone, Work Phone, Cellular Phone, 500-number, and Voice Mail. If Icon Type = Work

RESTRICTION

Seq.	Field	Field Type	Required/Conditional/Optional	Default Value	Field Length/Char	Valid Values	Comments
						Numeric Pager, Alpha-numeric Pager, Numeric Sky Pager, Alpha-numeric Sky Pager, Voice Mail, 500-Number, E-mail	<p>Phone, then Destination Address Type will be a list of Home Phone, Work Phone, Cellular Phone, 500-number, and Voice Mail.</p> <p>If Icon Type = Cellular Phone, then Destination Address Type will be a list of Home Phone, Work Phone, Cellular Phone, 500-number, and Voice Mail.</p> <p>If Icon Type = Video Phone, then Destination Address Type will be a list of Voice Mail and Video Phone.</p> <p>If Icon Type = Toll-free Number, then Destination Address Type will be defaulted to Toll-free Number.</p> <p>If Icon Type = Home Fax, then Destination Address Type will be a list of Home Fax, and Work Fax.</p> <p>If Icon Type = Work Fax, then Destination Address Type will be a list of Home Fax, and Work Fax.</p> <p>If Icon Type = Desktop Data Conferencing, then Destination Address Type will be defaulted to Desktop Data Conferencing.</p> <p>If Icon Type = Desktop Video Conferencing, then Destination Address Type will be defaulted to Desktop Video Conferencing.</p> <p>If Icon Type = Numeric Pager, then Destination Address Type will be defaulted to Numeric Pager.</p> <p>If Icon Type = Alpha-numeric Pager, then Destination Address Type will be defaulted to Alpha-numeric Pager.</p> <p>If Icon Type = Numeric</p>

Seq.	Field	Field Type	Required/ Conditional/ Optional	Default Value	Field Length/ Char.	Valid Values	Comments
							<p>Sky Pager, then Destination Address Type will be defaulted to Numeric Sky Pager.</p> <p>If Icon Type = Alpha-numeric Sky Pager, then Destination Address Type will be defaulted to Alpha-numeric Sky Pager.</p> <p>If Icon Type = Voice Mail, then Destination Address Type will be a list of Home Phone, Work Phone, Cellular Phone, 500-number, and Voice Mail.</p> <p>If Icon Type = 500-number, then Destination Address Type will be a list of Home Phone, Work Phone, Cellular Phone, 500-number, and Voice Mail.</p> <p>If Icon Type = E-mail, then Destination Address Type will be defaulted to E-mail.</p>
9	Add a Row	Selection button					
10	SUBMIT	Selection button					
11	CANCEL	Selection button					

## Behavior - Enter Time-of-day based Routing screen

The following events describe the expected behavior of the "Enter Time-of-day based Routing" screen.

Event Name	Basic Course	System Behavior
"Add a Row" button is clicked		The Java applet will add a blank row to the table under the "Routing Table Section". The fields will preserve their characteristics e.g., pull-down menu capabilities.
"SUBMIT" button is clicked	Launch "Result of Information Entered" screen.	Add routing information to the TIME OF DAY table for the Icon Address and Icon Type based on the Login ID.
"CANCEL" button is clicked	Launch "Intelligent Call Routing System Functions" screen.	

## Enter Pager Unavailability Schedule screen

This screen allows the subscriber to add information to the database relating to the unavailability of pager(s) that a subscriber may use.

This screen is shown after the user selects the "Enter Pager Unavailability Schedule" button on the "Intelligent Call Routing System Functions" screen.

Subscriber Country:	USA	Icon Type:	Numeric Pager
Time Zone:	MDT	Icon Address:	(1) 303-821-7889
<b>Routing Table Section:</b>			
Day		Time Interval	
Sunday	<input checked="" type="checkbox"/>	12:01 AM - 12 Mid Night	
Monday			
Tuesday			
Wednesday			
Thursday			
Monday	<input checked="" type="checkbox"/>	12:01 AM - 8 AM	
Tuesday			
Wednesday			
Thursday			
Friday			

OK
Add a Row
CANCEL

### Components - Enter Pager Unavailability Schedule screen

The following matrix describes the fields and buttons that are included on the "Enter Pager Unavailability Schedule" screen.

Seq.	Field	Field Type	Required/Conditional/Optional	Default Value	Field Length/Char.	Valid Values	Comments
1	Icon Type	Display only	Required		26 A/N	Numeric Pager, Alpha-numeric Pager, Numeric Sky Pager, Alpha-numeric Sky Pager	Value carried over from the "Intelligent Call Routing System Functions" screen.
2	Icon Address	Display only	Required		20 A/N		Value carried over from the "Intelligent Call Routing System Functions" screen.
Routing Table Section. The following 2 fields will repeat at least 7 times, once for each of the 7 days in a week. Any entries already present in the PAGER table will be displayed when the screen is launched.							
3	Day	Pull-down menu	Required		9 A	Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday	
4	Time Interval	Editable	Required		26 A/N	HH:MM AM[PM] - HH:MM AM[PM][Mid Night]	
5	Add a Row	Selection button					
6	SUBMIT	Selection button					
7	CANCEL	Selection button					

### Behavior - Enter Pager Unavailability Schedule screen

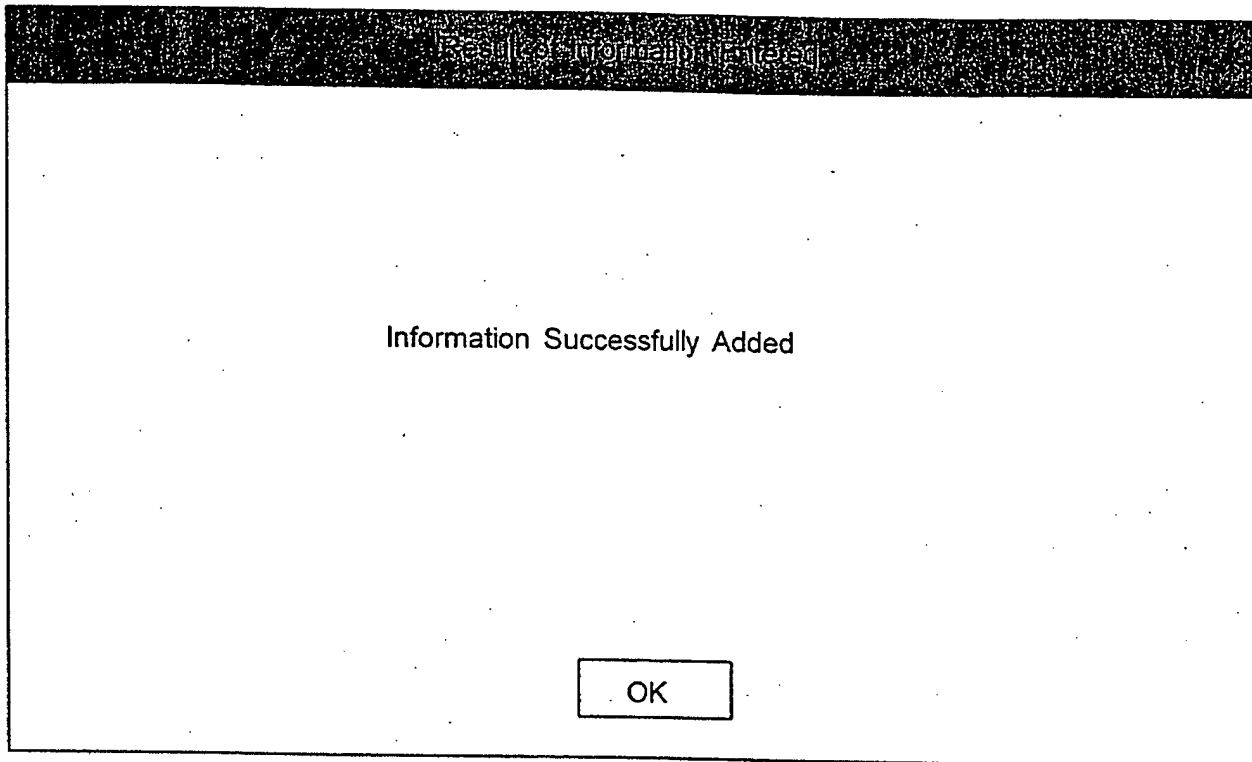
The following events describe the expected behavior of the "Enter Pager Unavailability Schedule" screen.

Event Name	Basic Course	System Behavior
"Add a Row" button is clicked		The Java applet will add a blank row to the table under the "Routing Table Section". The fields will preserve their characteristics e.g., pull-down menu capabilities.
"SUBMIT" button is clicked	Launch "Result of Information Entered" screen.	Add pager unavailability information to the PAGER table for the Icon Address and Icon Type based on the Login ID.
"CANCEL" button is clicked	Launch "Intelligent Call Routing System Functions" screen.	

## Result of Informatic Entered screen

This screen shows the result (only positive) of adding routing information to the database.

This screen is shown after the user selects the "SUBMIT" button on the "Enter Date-based Routing" "Enter Time-of-day based Routing", or "Enter Pager Unavailability Schedule" screen.





### Components - Result Information Entered screen

The following matrix describes the fields and buttons that are included on the "Result of Information Entered" screen.

Seq.	Field	Field Type	Required/Conditional/Optional	Default Value	Field Length/Char.	Valid Values	Comments
1		Display only	Required		30 A	Information Successfully Added	
2	OK	Selection button					

### Behavior - Result of Routing Information Entered screen

The following events describe the expected behavior of the "Result of Information Entered" screen.

Event Name	Basic Course	System Behavior
"OK" button is clicked	Launch "Intelligent Call Routing System Functions" screen.	

## APPENDIX 2

APPENDIX 2 gives a detailed view of the database that carries the routing and time zone information.

### SUBSCRIBER Table:

This table stores subscriber information.

The part of the Icon Address field within brackets represents the country code. This is needed because two subscribers from two different countries may have the same phone number.

This table is created as part of offering the DirectoryTalk service.

Subscriber Name	Login ID	Password	Subscriber Country	Time Zone	Icon Type	Icon Address
John Doe1	johndo1	XXXXXXXX	USA	MDT	Work Phone, Home Phone, Numeric Pager, Toll-free Number, Cellular Phone, Voice Mail, Video Phone, E-mail	(1) 303-896-1000, (1) 303-788-1000, (1) 303-821-7889, (1) 1-800-345-2222, (1) 303-435-5565, (1) 303-896-3333, (1) 303-896-4444, jdoe1@abcinc.com
John Doe2	johndo2	XXXXXXXX	India	IST	Home Phone, Cellular Phone, Home Office, Voice Mail, Home Fax, Desktop Data Conferencing, Desktop Video Conferencing, E-mail	(91) 44-233-2121, (91) 44-288-2122, (91) 44-233-2123, (91) 44-234-2100, (92) 44-233-2125, jdoe2@data.xyzinc.com, jdoe2@video.xyzinc.com, jdoe2@xyzinc.com

DAFE Table:

This table stores information relating to the date-based routing criteria. Travel dates that are up to 6 months into the future are allowed to be added to the table. On the first day of each month, the system will purge entries that are two months old. In other words, the system will only keep travel dates for the previous month and those for the next 6 months.

Icon Address	Icon Type	Travel Date	Visiting Country	Visiting Country Time Zone	Destination Address	Destination Address Type
(1) 303-896-1000, (1) 303-788-1000, (1) 303-435-5565	Work Phone, Home Phone, Cellular Phone	10/15/1998	USA	EST	(1) 201-741-1000	Work Phone
(1) 303-821-7889	Numeric Pager	10/15/1998	USA	EST	(1) 201-821-1230	Numeric Pager
(1) 1-800-345-2222	Toll-free Number	10/15/1998	USA	EST	(1) 1-888-233-2456	Toll-free Number
(1) 303-896-1000, (1) 303-788-1000, (1) 303-435-5565	Work Phone, Home Phone, Cellular Phone	10/16/1998	USA	EST	(1) 201-695-1230	Cellular Phone
(1) 303-821-7889	Numeric Pager	10/16/1998	USA	EST	(1) 201-821-1230	Numeric Pager
(1) 1-800-345-2222	Toll-free Number	10/16/1998	USA	EST	(1) 1-888-233-2456	Toll-free Number
(1) 303-896-1000, (1) 303-788-1000, (1) 303-435-5565	Work Phone, Home Phone, Cellular Phone	10/30/1998	France	FST	(22) 12-345-3456	Work Phone
(1) 303-821-7889	Numeric Pager	10/30/1998	France	FST	(22) 12-451-3230	Numeric Pager
(1) 1-800-345-2222	Toll-free Number	10/30/1998	France	FST	(22) 1-800-333-2444	Toll-free Number
(91) 44-233-2121, (91) 44-288-2122, (91) 44-233-2123, (91) 44-234-2100	Home Phone, Cellular Phone, Home Office, Voice Mail	12/10/1998	S. Korea	KST	(31) 77-478-9999	Cellular Phone
(91) 44-233-2124	Home Fax	12/10/1998	S. Korea	KST	(31) 77-478-9980	Work Fax
(91) 44-233-2121, (91) 44-288-2122, (91) 44-233-2123, (91) 44-234-2100	Home Phone, Cellular Phone, Home Office, Voice Mail	12/11/1998	Singapore	SST	(20) 15-345-1234	Work Phone
(91) 44-233-2124	Home Fax	12/11/1998	Singapore	SST	(20) 15-345-1230	Work Fax
(91) 44-233-2121, (91) 44-288-2122, (91) 44-233-2123, (91) 44-234-2100	Home Phone, Cellular Phone, Home Office, Voice Mail	12/30/1998	Australia	EST	(81) 441-456-9834	Voice Mail
(91) 44-233-2124	Home Fax	12/30/1998	Australia	EST	(81) 441-456-9824	Work Fax

## TIME OF DAY Table:

This table stores information relating to the time-of-day based routing criteria.

Icon Address	Icon Type	Day	Time Interval	Destination Address	Destination Address Type
(1) 303-896-1000, (1) 303-435-5565, (1) 303-896-4444	Work Phone, Cellular Phone, Video Phone	Sunday	12:01 AM - 12 Mid Night	(1) 303-896-3333	Voice Mail
(1) 303-896-1000, (1) 303-435-6656, (1) 303-896-4444	Work Phone, Cellular Phone, Video Phone	Monday	12:01 AM - 8 AM	(1) 303-896-3333	Voice Mail
(1) 303-788-1000	Home Phone	Monday	8:01 AM - 5 PM	(1) 303-896-1000	Work Phone
(1) 303-788-1000	Home Phone	Monday	5:01 PM - 7 PM	(1) 303-435-6656	Cellular Phone
(1) 303-896-1000, (1) 303-788-1000, (1) 303-435-5565, (1) 303-896-4444	Work Phone, Home Phone, Cellular Phone, Video Phone	Monday	10:01 PM - 12 Mid Night	(1) 303-896-3333	Voice Mail
(1) 303-896-1000, (1) 303-435-6656, (1) 303-896-4444	Work Phone, Cellular Phone, Video Phone	Tuesday	12:01 AM - 8 AM	(1) 303-896-3333	Voice Mail
(1) 303-788-1000	Home Phone	Tuesday	8:01 AM - 5 PM	(1) 303-896-1000	Work Phone
(1) 303-788-1000	Home Phone	Tuesday	5:01 PM - 7 PM	(1) 303-435-6656	Cellular Phone
(1) 303-896-1000, (1) 303-788-1000, (1) 303-435-5565, (1) 303-896-4444	Work Phone, Home Phone, Cellular Phone, Video Phone	Tuesday	10:01 PM - 12 Mid Night	(1) 303-896-3333	Voice Mail
(1) 303-896-1000, (1) 303-435-6656, (1) 303-896-4444	Work Phone, Cellular Phone, Video Phone	Wednesday	12:01 AM - 8 AM	(1) 303-896-3333	Voice Mail
(1) 303-788-1000	Home Phone	Wednesday	8:01 AM - 5 PM	(1) 303-896-1000	Work Phone
(1) 303-788-1000	Home Phone	Wednesday	5:01 PM - 7 PM	(1) 303-435-6656	Cellular Phone
(1) 303-896-1000, (1) 303-788-1000, (1) 303-435-5565, (1) 303-896-4444	Work Phone, Home Phone, Cellular Phone, Video Phone	Wednesday	10:01 PM - 12 Mid Night	(1) 303-896-3333	Voice Mail
(1) 303-896-1000, (1) 303-435-6656, (1) 303-896-4444	Work Phone, Cellular Phone, Video Phone	Thursday	12:01 AM - 8 AM	(1) 303-896-3333	Voice Mail
(1) 303-788-1000	Home Phone	Thursday	8:01 AM - 5 PM	(1) 303-896-1000	Work Phone
(1) 303-788-1000	Home Phone	Thursday	5:01 PM - 7 PM	(1) 303-435-6656	Cellular Phone
(1) 303-896-1000, (1) 303-788-1000, (1) 303-435-5565, (1) 303-896-4444	Work Phone, Home Phone, Cellular Phone, Video Phone	Thursday	10:01 PM - 12 Mid Night	(1) 303-896-3333	Voice Mail
(1) 303-896-1000, (1) 303-435-6656,	Work Phone, Cellular Phone,	Friday	12:01 AM - 8 AM	(1) 303-896-3333	Voice Mail

(1) 303-896-4444	Video Phone				
(1) 303-788-1000	Home Phone	Friday	8:01 AM - 5 PM	(1) 303-896-1000	Work Phone
(1) 303-788-1000	Home Phone	Friday	5:01 PM - 7 PM	(1) 303-435-6656	Cellular Phone
(1) 303-896-1000, (1) 303-788-1000, (1) 303-435-5565, (1) 303-896-4444	Work Phone, Home Phone, Cellular Phone, Video Phone	Friday	10:01 PM - 12 Mid Night	(1) 303-896-3333	Voice Mail
(1) 303-896-1000, (1) 303-435-5565, (1) 303-896-4444	Work Phone, Cellular Phone, Video Phone	Saturday	12:01 AM - 12 Mid Night	(1) 303-896-3333	Voice Mail
(91) 44-233-2121, (91) 44-288-2122, (91) 44-233-2123	Home Phone, Cellular Phone, Home Office	Sunday	12:01 AM - 12 Mid Night	(91) 44-234-2100	Voice Mail
(91) 44-233-2121, (91) 44-288-2122, (91) 44-233-2123	Home Phone, Cellular Phone, Home Office	Monday	12:01 AM - 8 AM	(91) 44-234-2100	Voice Mail
(91) 44-233-2121, (91) 44-288-2122, (91) 44-233-2123	Home Phone, Cellular Phone, Home Office	Monday	10:01 PM - 12 Mid Night	(91) 44-234-2100	Voice Mail
(91) 44-233-2121, (91) 44-288-2122, (91) 44-233-2123	Home Phone, Cellular Phone, Home Office	Tuesday	12:01 AM - 8 AM	(91) 44-234-2100	Voice Mail
(91) 44-233-2121, (91) 44-288-2122, (91) 44-233-2123	Home Phone, Cellular Phone, Home Office	Tuesday	10:01 PM - 12 Mid Night	(91) 44-234-2100	Voice Mail
(91) 44-233-2121, (91) 44-288-2122, (91) 44-233-2123	Home Phone, Cellular Phone, Home Office	Wednesday	12:01 AM - 8 AM	(91) 44-234-2100	Voice Mail
(91) 44-233-2121, (91) 44-288-2122, (91) 44-233-2123	Home Phone, Cellular Phone, Home Office	Wednesday	10:01 PM - 12 Mid Night	(91) 44-234-2100	Voice Mail
(91) 44-233-2121, (91) 44-288-2122, (91) 44-233-2123	Home Phone, Cellular Phone, Home Office	Thursday	12:01 AM - 8 AM	(91) 44-234-2100	Voice Mail
(91) 44-233-2121, (91) 44-288-2122, (91) 44-233-2123	Home Phone, Cellular Phone, Home Office	Thursday	10:01 PM - 12 Mid Night	(91) 44-234-2100	Voice Mail
(91) 44-233-2121, (91) 44-288-2122, (91) 44-233-2123	Home Phone, Cellular Phone, Home Office	Friday	12:01 AM - 8 AM	(91) 44-234-2100	Voice Mail
(91) 44-233-2121, (91) 44-288-2122, (91) 44-233-2123	Home Phone, Cellular Phone, Home Office	Friday	10:01 PM - 12 Mid Night	(91) 44-234-2100	Voice Mail
(91) 44-233-2121, (91) 44-288-2122, (91) 44-233-2123	Home Phone, Cellular Phone, Home Office	Saturday	12:01 AM - 8 AM	(91) 44-234-2100	Voice Mail
(91) 44-233-2121, (91) 44-288-2122, (91) 44-233-2123	Home Phone, Cellular Phone, Home Office	Saturday	10:01 PM - 12 Mid Night	(91) 44-234-2100	Voice Mail

# PAGER Table:

This table stores information relating to the unavailability of different types of pagers owned by a subscriber.

Icon Address	Icon Type	Day	Time Interval
(1) 303-821-7889	Numeric Pager	Sunday	12:01 AM - 12 Mid Night
(1) 303-821-7889	Numeric Pager	Monday	12:01 AM - 8 AM
(1) 303-821-7889	Numeric Pager	Monday	10:00 PM - 12 Mid Night
(1) 303-821-7889	Numeric Pager	Tuesday	12:01 AM - 8 AM
(1) 303-821-7889	Numeric Pager	Tuesday	10:00 PM - 12 Mid Night
(1) 303-821-7889	Numeric Pager	Wednesday	12:01 AM - 8 AM
(1) 303-821-7889	Numeric Pager	Wednesday	10:00 PM - 12 Mid Night
(1) 303-821-7889	Numeric Pager	Thursday	12:01 AM - 8 AM
(1) 303-821-7889	Numeric Pager	Thursday	10:00 PM - 12 Mid Night
(1) 303-821-7889	Numeric Pager	Friday	12:01 AM - 8 AM
(1) 303-821-7889	Numeric Pager	Friday	10:00 PM - 12 Mid Night
(1) 303-821-7889	Numeric Pager	Saturday	12:01 AM - 8 AM
(1) 303-821-7889	Numeric Pager	Saturday	10:00 PM - 12 Mid Night

### TIME\_ZONE Table:

This table stores data relating to country-specific information covering all countries in the world and their respective time zones (it is assumed that the Portal or Directory Provider's server is running in CA, USA). This table is created as part of offering the service.

Country	Country Code	Country Time Zone	Offset
Argentina	12	AST (Argentina Std Time)	2:00
Australia	81	EST (Eastern Std Time)	14:00
Australia	81	CST (Central Std Time)	15:00
Australia	81	PST (Pacific Std Time)	16:00
Brazil	13	BST (Brazil Std Time)	2:00
Chile	14	CST (Chile Std Time)	-3:00
Denmark	15	DST (Denmark Std Time)	7:30
India	91	IST (Indian Std Time)	12:30
France	22	FST (French Std Time)	8:30
Singapore	20	SST (Singapore Std Time)	13:00
S. Korea	31	KST (S. Korea Std Time)	12:00
USA	1	EST (Eastern Std Time)	3:00
USA	1	CST (Central Std Time)	2:00
USA	1	MST (Mountain Std Time)	1:00
USA	1	PST (Pacific Std Time)	0
USA	1	HST (Hawaii Std Time)	-4:00

### Definition of fields:

1. Subscriber Name - Name of the person subscribing to a Portal or Directory Provider.
2. Login ID - Login ID of the subscriber.
3. Password - Password selected by the subscriber.
4. Subscriber Country - Subscriber's country of residence.
5. Time Zone - Time zone of the subscriber in the country of residence.
6. Icon Type - A list of all the devices owned by the subscriber displayed in a selection box.
7. Icon Address - Actual address corresponding to the device which is being displayed in a selection box.
8. Travel Date - Date on which the subscriber is expected to be in a different time zone within the country of residence or in a foreign country.
9. Visiting Country - Name of country the subscriber is expected to visit on the Travel Date. A pull-down list of countries will be presented for selection.
10. Visiting Country Time Zone - Time zone of the subscriber in the country visited. A pull-down list of all time zones of the Visiting Country will be presented for selection.
11. Destination Address - An address to which the system will complete the call when a caller selects a particular Icon Type.
12. Destination Address Type - Device type of the Destination Address to which the call is finally completed.
13. Day - Day of the week. Valid values are Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday.
14. Time Interval - Represents the time interval at which the subscriber may (per **TIME\_OF\_DAY** table) or may not be reached (per Pager table) at the Destination Address in the Subscriber Country of residence.
15. Country - Represents a country from a list of all countries in the world.
16. Country Code - Country Code assigned to each country for making telephone calls.
17. Country Time Zone - Represents a time zone applicable to the Country. Valid values include a list of all possible time zones applicable to the Country.
18. Offset - Represents the number of hours and minutes the server is either ahead or behind a particular Country and Country Time Zone.



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Holme Roberts & Owen LLP

August 4, 1999



Thiru Srinivasan  
U S WEST, Inc.  
1005 17th Street, Suite 1090  
Denver, CO 80202

Re: "INTELLIGENT CALL ROUTING SYSTEM"  
Our File No.: 42059-00970  
U S WEST Docket No.: 1613

*Kenneth J. Johnson*  
(303)866-0639  
johnsok@hro.com

Dear Thiru:

Enclosed is a draft of the above-identified patent application for your review. Please review the this application to assure that it properly and accurately describes the invention as originally disclosed in your Invention Disclosure Sheet. Please make your changes on the enclosed copy and when you are finished please call me at 866-0639 so we may discuss this application further.

*Attorneys at Law*

1700 Lincoln Street  
Suite 4100  
Denver, Colorado  
80203-4541  
Tel (303)861-7000  
Fax (303)866-0200  
www.hro.com

Denver  
Salt Lake City  
Boulder  
Colorado Springs  
London

While reviewing the application, keep in mind that the claims must particularly point out and distinctly claim the subject matter of the invention, so it is important that you review them very carefully. The claims attempt to cover the invention in its broadest aspects and also more specifically. The broadest claims should represent only the essential features of the invention. Review these claims for any element which could be eliminated without losing the essence of the invention. The remaining claims, in different degrees, are more limited, i.e., they contain additional elements. Check for limitations which are completely unrelated to the inventive concept, as well as additional limitations which should be included.

*Please remember that this application is Confidential and Proprietary and must be treated accordingly. It should be secured at night and adequately protected during the day.*

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## INTELLIGENT CALL ROUTING SYSTEM

### FIELD OF THE INVENTION

The invention described herein relates to a communications routing system, and more particularly to a telephone call routing system which employs a data network such as the Internet.

### BACKGROUND ON THE INVENTION

Many phone companies today offer time-of-day, day-of-week, and date routing of telephone calls based on an architecture called Advanced Intelligent Networks (AIN). Through a Public Switch Telephone Network (PSTN) which employs AIN, a subscriber to this service may be allowed to program, through touch-tone inputs, the routing of incoming telephone calls to a particular phone number based on time-of-day, day-of-week, and date. Typically, AIN software is installed in the switches of the PSTN (for example, ESS, DMS, etc.) at the Service Control Points (SCP).

In operation, the call travels to the destination switch, which detects an AIN trigger, and sends a query to the SCP which contains the programmed information as to how to route the call. Once the relevant information is located, the SCP forwards the call information to the destination switch which routes the call accordingly.

With regards to establishing telephonic connections, a number of Internet search engine companies are providing access to telephone records for individuals. Stored in a database which is searchable over the Internet are a listing of telephone numbers or possibly E-mail addresses for large segments of the population. Internet users who employ these search capabilities may provide an individual's name or other relevant information, which is then used in a search of the database. Once the telephone number or other communications information is located, it may be presented to the Internet user through a screen display.

#### SUMMARY OF THE INVENTION

The inventor has recognized that although AIN switches are an effective way of routing calls, some drawbacks do exist. The drawbacks may include the cumbersome method of programming the system through use of touch tone inputs and voice prompts. Further, an AIN system may contain limitations on the number of paths which may be programmed for a particular number, or may have limitations with regards to programming during certain times of the day.

In light of the above described drawbacks, the inventor has provided a system which provides for the automated routing of telephone calls or other electronic communications. Through the system described herein, a connection may be established between

the components of the public switch telephone network (PSTN) and a website on the internet. Information which is extracted from the incoming calls to the PSTN may be used to search a database connected to the website routing information and then employ that information to route the communications incoming calls.

The system described herein may include a switching devices within the PSTN which receives incoming calls from remote locations and act to route the calls to designated destinations. Included in the switching device is an apparatus for identifying and extracting the destination address for a calls received. The extracted destination address may then be provided to a service control point (SCP) which provides routing information relating to the destination address. The SCP incorporated in the PSTN may include a interface for connecting with a data network such as the Internet.

The SCP may include web browsing capabilities and may establish a connection with servers connected in the data network. Once a desired website is connected, the SCP may include the functionality to use the extracted destination address to perform a search of the records located at the selected website. Once information relating to the destination phone number is located, the information may be retrieved and used in the PSTN to route the incoming call.

In one aspect of the invention, the SCP may further include a database which lists subscribers to an automatic routing

service. When the destination address for the incoming call is extracted, a search may be performed of the database in order to determine if the destination address is associated with a subscriber of the service. If it is determined that the destination number is associated with a subscriber, the address may be converted to a search query by the SCP, and a search performed via the data network to locate communications information for the destination address.

In another aspect of the invention, the switching device may be part of a SS7 network and destination information is provided to the SCP via the Transaction Capabilities Application Part (TCAP). TCAP supports the exchange of noncircuit related data between applications across the SS7 network. Queries and responses sent between SSPs and SCPs are carried in TCAP messages. The SCP includes an interface to the Internet where searches may be performed in the databases located at various websites. Routing may be provided through both AIN and non-AIN switches.

The websites which are accessed by the system described above, may include a number of relational tables which are searchable using the extracted destination address. The relational tables in the database are created by relating the various destination addresses to various routing information. For example, the routing information may direct that the incoming call, instead of ringing a home or office number, connect to a

subscribers voice mail. Also associated with the destination address may be other information which, based on either the date, day of the week, or time of day, provides a destination address for establishing a line of communication.

In one aspect of the invention, the relational database may include a date table. In the date table, routing information is associated with a destination address depending on the date in which the party who is trying to reach a subscriber makes a call. For example, the original destination address listed in a table for a particular subscriber may be a home phone number, a work number, and/or a cellular number. The subscriber knows that on a certain date they may not be able to answer any of these numbers, but will be able to answer another number such as a hotel number or a office number, this routing address may be associated with the original destination address. In the date table other information resident in the date table entries may include the date on which the association is applicable, the country in which the ultimate destination number will be answered, and the type of address (i.e. work, home, cellular) the ultimate destination address.

In yet another aspect of the invention, additional tables may also be stored in the relational database and associated with a particular destination address. In this table, the original destination address will be such things as a home phone, work phone or cellular phone for a subscriber. However, in this case,



the routing information will be retrieved based on the particular day of the week and the time of day in which the connection is being attempted. In operation, a time interval for a particular destination address may be programed for the same time every day. In addition, the times of the day may be programed based on a particular day of the week. As with the date table, in the time of day table the routing address may be any destination established by the subscriber. These may include, but are not limited to, voice phone number, alternate work number and alternate home number, a cellular phone, pager.

In yet another aspect of the invention, a special table for routing incoming pages may be provided. One function of this table is to automatically control the time periods when a pager will receive incoming pages. For example, the table may be located by performing a search using incoming pager address. Associated with the pager address may be a particular day of the week as well as particular time interval during that day when pages will be received. Based on the time of day and the day a particular incoming call is received, the page may either be terminated or not.

In yet another aspect of the invention, the network server upon which the relational database are located include the functionality for a subscriber to access the information stored therein. The network server includes a number of display interfaces which may be presented over the network to the

subscribers using a web browser. In one aspect of the invention, a first interactive screen display may be presented which provides the dialog boxes in which personal information for the subscriber may be entered. Once the subscriber has entered identifying information, routing information, such as telephone numbers, voice mail numbers, video phone numbers, E-mail addresses, may be presented.

While viewing the screen display described above, additional selections may be made by the subscriber to input programing as to the routing of incoming telephone calls. In other interfaces presented, information may be provided as to destination addresses to which calls will be routed when a particular number is dialed. The time of day, the day of the week, or the date may be associated with a particular routing address. Further, interactive screen displays may be provided for entering access information for pagers and other communications devices such as voice mail. Upon entry of the information described above, the data is stored in a relational database and is searchable by the PSTN as well as other external parties.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 discloses a system diagram for the telephone network in connection with the data network.

Figure 2 discloses an internal system diagram for the network server.

Figure 3 discloses a relational database table which includes communications information.

Figure 4 discloses a relational database table which provides address associations based on date.

Figure 5 discloses a relational database table which provides address associations based on day and time of day.

Figure 6 discloses a relational database table which relates incoming pager addresses to times of day when pages may be received.

Figure 7a-c discloses a flowchart which describes the operation of the routing system.

Figure 8 discloses an interactive screen display through which system information may be viewed.

Figure 9 discloses an interactive screen display through which information related to the date table may be viewed.

Figure 10 disclose an interactive screen display through which information related to the time of day table may be viewed.

Figure 11 discloses an interactive screen display through which programming information may be input for the pager unavailability schedule.

#### DETAILED DESCRIPTION

Disclosed in Figure 1 is an overall diagram for the routing system described herein. Included in the system is the Public Switch Telephone Network (PSTN)10. The PSTN, as is well known,

is an electronic network which provides for audio and other types of communication between remotely located parties. The PSTN, based on destination addresses associated with incoming calls, routes the calls accordingly. As part of the present system, the PSTN detects incoming calls from caller 12. These calls may be received via land line phones or over a wireless network. Once calls are received, the destination addresses for the calls are extracted at the switching service points 14. SSP's are switches that originate, terminate or tandem calls. An SSP sends signaling messages to other SSPs to set up, manage and release voice circuits required to complete a call. An SSP may also send a query message to a centralized database (and Service Control Point (SCP)) to determine how to route a call. An SCP sends a response to the originating SSP containing the routing number associated with the dialed number. Alternate routing numbers may be used by the SSP if the primary number is busy or the call is unanswered within a specified time.

Communications between the SSP and the SCP may be facilitated through use of Transaction Capabilities Applications Part (TCAP) which supports the exchange of noncircuit related data between applications across an SS7 network. Query responses sent between SSPs and SCPs are carried in TCAP messages. For example, an SSP may send a TCAP query to determine the routing address associated with the dialed number, or to detect the personal identification number of a calling card user.

In connection with the SCP 22 may be a database 24 which may provide information relating to the routing of telephone calls. A connection may also be established from the SCP 22 and data network 26. The data network may be the Internet or any similar network which includes a number of nodes which may be accessed using a web browser or like device.

One node on the Internet may be communications information server 28. A number of network servers include relational databases which are searchable by parties over the Internet. As seen in Fig. 1, in addition to connections established by the SCP, connections may be established to the data network by the system users or subscribers via the Public Switch Telephone Network to an Internet Service Provider (ISP) 30. A subscriber 32 may employ a personal computer with a modem to connect to the PSTN 10.

Disclosed in Figure 2 is an internal system diagram for the communications information server 28. Included in the network server is network interface 40 which provides for the exchange of signals from the server to the data network. The network interface 40 is connected to central processor 42 which controls the internal functions of the network server. Also in connection with the central processor 42 are caller information database 44 and display graphics database 46. Contained in caller information database 44 are various relational tables which contain information for routing telephone calls. Contents of the

caller information database 44 will be discussed in greater detail below. Contained in display graphics database 46 are the interactive screen displays presented to subscribers when access is granted to the server. The use and operation of these interactive display graphics will be described in greater detail below.

As is well known in the use of PSTN's, Advanced Intelligent Network (AIN) switches are employed which provide for automatic routing of incoming telephone calls to preprogramed destinations. In an AIN System information for routing of telephone calls stored in a database connected to a SCP. When a particular destination address associated with an incoming call is detected at a switching point, a signal may be sent to the SCP and the appropriate routing information retrieved. Once this information is known, the SCPs may provide routing information to the switch so as to direct the telephone call to the desired destination. One drawback of AINs currently employed are the difficulty which subscribers to the services may have in programing their choices. Programing commands are entered by dialing a particular destination, responding to voice prompts, and then entering key strokes through the telephone receiver to select choices or enter numerals.

According to the present invention, routing information for telephone calls received at Service Switching Points may be stored in a relational database which is accessible by a SCP over

a data network such as the Internet. One advantage of storing information in such a location is that it is also accessible by subscribers through a personal computer over the data network information stored on the server may be accessed and updated at will.

Disclosed in Figures 3-6 are examples of relational data tables which may be stored in the database 44 of communications server 28. In the table disclosed in Figure 3, informational listings are provided for the subscribers to the services. Table 50 includes cells which include descriptive information for the subscriber as well as login ID and password. Further information which may be included in table includes the subscribers country of origin, the time zone in which they are residents. Because the information stored in the table is accessible over a data network, various icons may be associated with the communications information stored therein. As can be seen, each subscriber may have icons for a work phone, home phone, numeric pager, toll-free number, wireless phone, voice mail, video phone, and e-mail. Associated with each of the icon types is the corresponding telephone number for that subscriber or other alpha numeric communications information. The number of listings shown is not meant as a limitation on the scope of the invention, and one skilled in the art would know any number of types of communication information may be stored in the table.

In one aspect of the invention, not only is this information accessible and searchable by a SCP, it may also be accessible by parties who access the communications network server to locate information relating to a particular subscriber. The data table described herein may be included as part of a commercial website which allows parties who establish a connection with the website to enter search terms and locate communications information (such as phone numbers) for a particular party. When these interested parties gain access to the server and a service is performed for the subscriber, a display page may be presented which includes a number of icons which when selected provide communications information for a particular party. As can be seen in table 50, icons are associated with the particular icon address and when the icon is selected, the corresponding icon address will be presented to the system user.

Disclosed in Figure 4 is a relational database table 60, which is employed by the system for associating particular icon addresses (i.e., phone numbers) with particular destination addresses depending on the particular date a icon address is used. The table includes a number of columns. As can be seen, the column headings include icon address 62, icon type 64, travel date 66, visiting country 68, visiting country time zones 70, routing address 72, and routing address type 74. Each of the columns includes routing information with regards to a particular destination address. For example, as can be seen in the column



headings, a number of different destination addresses for a work phone, home phone and cellular phone are associated with a destination address in column 72. This association is only good for the travel date of 10/15/1998. Other information may be included in the table such as the country the subscriber is visiting on this date, the visiting country time zone, as well as the destination address type. The use of this table in the context of the system described herein will be described in greater detail below.

Disclosed in Figure 5 is relational database table 80 employed for routing calls according to day and time. Also included in this relational database table are columns for icon address 82, icon type 84, day 86, time interval 88, destination address 90, and destination address type 92. This time-of-day table is employed in situations where a particular destination address is being routed to a predetermined routing address on a particular day at a particular time. In the example of row 94, a number of destination addresses are listed with responding address types. Also included is a day as well as a time interval. The programming information is entered such that on Sundays between a particular time period, any time any of the listed destination addresses listed in row 94 are called, the connection will be routed to the corresponding routing address. As can be seen, the routing address in row 94 is of the voice mail type.

Disclosed in Figure 6 is a relational database table 80 which includes routing information for directing incoming calls for pagers. Included in the table is a destination address column 102, a icon type column 104, a day column 106, and time interval column 108. When a pager destination address associated with an icon address is detected, the table may be retrieved and based on the information stored in one of the rows such as 110, each page will be forwarded or it will be terminated.

In order for the system to operate employing the relational database tables described above, a hierarchy must be established as to the order in which routing information may be selected. As can be seen by review of the tables described above, the routing information has the possibility of overlapping in certain situations. For example, a subscriber may have entered routing information for a particular date. This routing information is included in the date table 60 of Figure 4. In addition, a subscriber also may have programmed time of day information for routing the same telephone number in the time of day table disclosed in Figure 5. In the situation where there is contradicting information, the system described herein may be programed to select the date information first. If no date information is located, then a search may be performed of the time-of-day tables. If no information is found there, then a search may be performed of the pager table 100.

Disclosed in Figure 7 is a flow chart which describes in detail the operations of the routing system described herein. Initially, an incoming call is detected at the SSP and the destination address is extracted. Once extracted this address is transmitted to the SCP which performs a search of the database to determine whether the party being called is a subscriber to the service. If it is determined that the party is not a subscriber, the call is then connected to the destination address dialed by the party who originated the call.

If the destination address is located in the database, it is then determined that the party to be reached is a subscriber to the service. At this point, a connection is established by the SCP over the data network with the communication server. Using the destination address, a profile for the party to be called is then retrieved. Based on a profile given, a determination may be made then as to the current date and time for the location of the subscriber. This information may then be employed to identify routing information.

As was described above, in order to account for overlapping routing information for a particular subscriber, a hierarchy is established for the order in which tables which contain routing information for a particular subscriber are searched. In the embodiment of the invention described herein, the date table is given the highest priority, followed by the time-of-day table, and then finally the pager table.

Once the subscriber profile are located and the date and time the subscriber is receiving the incoming call are determined, a search is performed of the date table. Returning again to Figure 4, a search is performed in column 62 to identify a matching destination address as to the one extracted from the incoming call by the PSTN. Once a matching address is found, the travel date in column 66 is read to make a determination as to whether the travel date matches the current time and date. If the dates are not matching, the search continues to locate a destination address and travel date which match the ones received from the telephone network. If matching information is located, the associated routing address is retrieved from column 72 and this information is provided over the data network to the SCP. The PSTN, using this retrieved information, may then route the call to the routing address identified in the date table.

If no matching destination address information is found in the date table, a search is then performed in the time-of-day table of Fig. 5. As with the date table, a search is performed in the destination address column 82 to locate a matching address. Once the matching address is located, the day column 86 is searched to determine if it matches the current day. If the day is not matching, a search continues to find a matching day. If no matching day is located, the search of the time-of-day table will end and the search of the pager table will begin.

If a matching day is found, a further analysis is performed to determine if the time interval within column 88 encompasses the current time for the incoming call. If the time is not matching, a search continues to another interval within the same day. If no interval is located, the search will then continue in the pager table. If a matching interval is found, the routing address associated with the time interval in column 90 is retrieved and this information is provided to the PSTN for routing of the telephone call.

If no matching information is located in the time of day table, a search is then performed of the pager table disclosed in Figure 6. As with the searches described above, a search is initially performed to locate a matching destination address in column 102. If the destination address for the incoming call does not match any of the destination addresses listed in the column, the search is terminated and the PSTN is directed to route the call to the destination address which was originally extracted from the incoming call. In the situation where a matching destination address is found, a search is then performed to locate the matching day of the week for when the incoming destination address was received. Once the matching day of the week is located, a further search is performed in column 108 to locate the matching time interval. If a matching time interval is found for the incoming call, the PSTN will then be directed to

initiate the page. If a matching day and/or time is not located, then the PSTN is directed to terminate the paging process.

An additional feature included in the system described herein is the functionality for subscribers to access and amend their own routing information in the communications network server. In order to perform this process, a subscriber would gain access to the network server through an ISP as shown in Figure 1. The subscriber may employ a personal computer with a modem and web browser software. Once access is gained to the network server, a log on screen for gaining access to the system may be presented to the subscriber. Through this display screen (not shown), a subscriber may enter an user I.D. and password.

Once a logon is complete, a user may be presented an interactive screen display such as that shown in Figure 8. In interactive screen display 20, a number of dialog boxes are provided through which a subscriber may either enter additional information or activate other functions of the system. Included in the screen display may be descriptive information for the subscriber such as the subscriber country 122 or the time zone within which the subscriber lives 124. The subscriber may edit this information using the dialog boxes shown. Personalized information for establishing icon type and destination addresses viewed and amended through dialog box 126. Through use of a pull down menu, an entire listing of telephone numbers and other communications information may be stored for a particular

subscriber. Through this dialog box, the subscriber may amend their own personalized information.

With regards to entering routing information into the system, a number of functions for this purpose may be initiated through screen display 20. Upon selection of the enter date-based routing button 128, a subscriber is provided with a display screen through which date-based routing information may be entered. Selections may also be made of the when they enter time-of-day base routing button 130 or the enter pager unavailability schedule button 132.

Interactive screen display 140 is disclosed in Figure 9. Through this screen display, a subscriber may enter customized information for date-base routing. Through dialog boxes 142 and 144, the subscriber may define the type of device and the destination address for which the date base routing will apply. Presented in these boxes may be any of the destination addresses listed in dialog box 120 of Figure 8. Returning again to Fig. 9, dialog box 146 provides for the entry and amendment of communications information for the date based table. Columns are provided in the dialog box for entering a particular date of travel 148, the country which is to be visited 150, the time zone of the country to be visited 152, the routing address 54 to which incoming calls will be routed as well as the routing address type 156. Through the rows 158, the system user enters the necessary information corresponding with the columns. A number

of pull down menus are provided in the dialog box 146 for entering or viewing certain types of information. In order to add particular row for entry of information, a subscriber may select the add-a-row button 162, which provides for another entry. When the entry or amendment of information is complete, the subscriber may select the "okay" button 160 and the information will be entered in the system.

Disclosed in Fig. 10 is a screen display 170 which provides for the presentation and amendments of information related to time-of-day based routing. As with the date base table, dialog boxes are also included in screen display 170 for entering the subscriber's country, the time zone, the icon type and icon address. Also, included in the display graphic 170 is a dialog box 172, which provides for the entry of routing information based on time of day. Columns included in the dialog box include day 174, time interval 176, routing address 178, and routing address type 180. As can be seen in row 182, the subscriber may select a pull down menu in the day column 174 to select a particular day for which the routing information may be entered. In column 176, the time interval in which the routing information will apply may be entered. The destination address to which the call will be routed is listed in 178 and the type of address for this destination is described in 180.

In order to add additional information, the subscriber may select the add-a-row button 86. Once the desired information or



amendments are complete, the subscriber may then select the "okay" button 184 for entry of this information into the system.

Finally, the display graphic 190 for presenting and amending information with regards to the pager unavailability schedule is disclosed in Figure 11. Through the display graphic 190, a subscriber may enter information about the times of day or days in which pages will be received. As with the above-described display graphics, dialog boxes are included in the display graphic 190 for entry of subscriber country, time zone, icon type, and icon address. Also included is a dialog box 192, which provides for the entry of information related to the routing of pages. Included in this display graphic are row 194, which provides for the selection of a particular day during the week in which the routing information will apply, and a time interval column 196, which designates the times within the selected day within which pages will be received. As can be seen in row 198, a subscriber may employ a pull down menu in order to select a particular day of the week. Then in the time interval column 196, the particular time interval in which pages will be routed to the subscriber is provided. To add additional information, the subscriber may select the add-a-row button 198. When all the routing information or amendments are complete, the subscriber may then select the "okay" button 200 to enter the information into the system.

Once the information has been entered into the system, tables are created or updated and the system may use the information stored in the relational tables in the manner described above. According to the system described herein, the subscriber may access the information at any time and provide additional routing information. The system may be further programmed to delete routing information after the date in which the routing information was applicable has passed or after a predetermined period.

The foregoing description of the present invention has been presented for purposes of illustration and description. Furthermore, the description is not intended to limit the invention to the form disclosed herein. Consequently, variations and modifications commensurate with the above teachings, and the skill or knowledge of the relevant art, within the scope of the present invention. The embodiments described hereinabove are further intended to explain best modes known for practicing the invention and to enable others skilled in the art to utilize the invention in such, or other, embodiments and with various modifications required by the particular applications or uses of the present invention. It is intended that the appended claims be construed to include alternative embodiments to the extent permitted by the prior art.

## CLAIMS

1. A telephone network comprising:

at least one switching device which receives incoming telephone calls and attempts to establish a telephonic connection with at least one callee, said switch comprising:

an identification device which retrieves calling information associated with the incoming telephone calls;

a network communications interface device in connection with identification device which transmits the calling information to a predetermined location on the data network and receives connection information which is employed by the switch to establish a telephone connection with the callee.

3. The telephone network of claim 1 wherein the data network is the Internet.

4. The telephone network of claim 1 wherein the network interface establishes a connection with a website which includes a programmable database that associates the calling information to destination information based on a predetermined association quality.

5. The telephone network of claim 4 wherein the switch further includes a searchable database which contains calling information for the incoming calls, which when identified provides the initiation of a search over the data network.

6. A communications information system comprising:  
a network interface device in connection with a data network which provides for the receipt and transmission of data signals from a public switched telephone network;

a searchable database which contains communications information for selected parties, where selected portions of the communications information for each of the selected parties is identifiable based on an association value; and

a processor in connection with the network interface device which is programmable to search the database, and based on the data signal received, to locate the selected portions of the communication information for the selected parties, and then provide the selected portions of the to the network interface for transmission over the data network.

7. The system of claim 1 wherein the association value is time of day in which data signal is received.

8. The system of claim 1 wherein the processor provides a display graphic through which communications information may be manually selected by a system user.

9. The system of claim 1 wherein data network is the Internet.

10. The system of claim 1 wherein the data signal is received from a telephone network switch with a data network connection, wherein the data signal is related to a telephone call information received at the switch.

11. The system of claim 1 wherein the data signal is a telephone number for one of the selected parties.

12. The system of claim 1 wherein the display graphic includes icons which are selectable to access the selected portions of the communications information.

13. The system of claim 1 wherein the network interface provides for connections established over the data network from a personal computer.

14. The system of claim 13 wherein the database is searchable through use of a personal computer and web browser.

15. The system of claim 1 wherein the selected portion of the communications information is telephone numbers.

16. The system of claim 1 wherein the telephone numbers include at least one of: home number, work number, cell phone number, pager number, IP telephony connection address.

17. A method for establishing a communication connection over a telephone network, comprising:

detecting an incoming communications signal;

extracting a destination address from the communications signal;

establishing a connection over a data network with a database and performing a search of the database using the extracted search term;

identifying communications information in the database associated with the search term; and

retrieving the selected portion of the communications information from the database and using the communications information to establish a telephonic connection.

18. The method of claim 17 wherein the data network is the Internet.

19. The method of claim 17 further including the step of providing an interactive display graphic through which the communications information in the database may be amended, added to and/or deleted.

20. The method of claim 17 wherein the search in the database is performed in a date table included in the database which includes routing information based on a date the incoming communications signal is received.

21. The method of claim 20 wherein if a search of the date table is unsuccessful, a the search is performed in a day and

time of day table included in the database which includes the routing information based on day of the week and time of day the communications signal is received.

22. The method of claim 21 wherein if a search of the day and time of day table is unsuccessful a search is performed of a pager table in the database which includes pager routing information.

23. The method of claim 22 wherein the communications signal represents at least one of: a home telephone number, a work telephone number, a cell phone number, a fax machine telephone number, a pager number, and IP address for establishing an IP telephony connection.

## ABSTRACT OF DISCLOSURE

An automated call routing system accesses and employs information stored in a database located on a data network. Switching points within a Public Switch Telephone Network (PSTN) identify the telephone numbers, i.e. destination addresses received. The destination address may be associated with subscribers, and if so, a search may be initiated over the data network in a database included in a website. Once the information associated with the subscriber is located in the database, the PSTN will retrieve the information, the incoming call may be routed. The automated call routing information stored in the database may also be accessible to the subscriber over a connection established through a data network. Various interactive screen displays are provided through which the system user may enter or amend information contained therein.



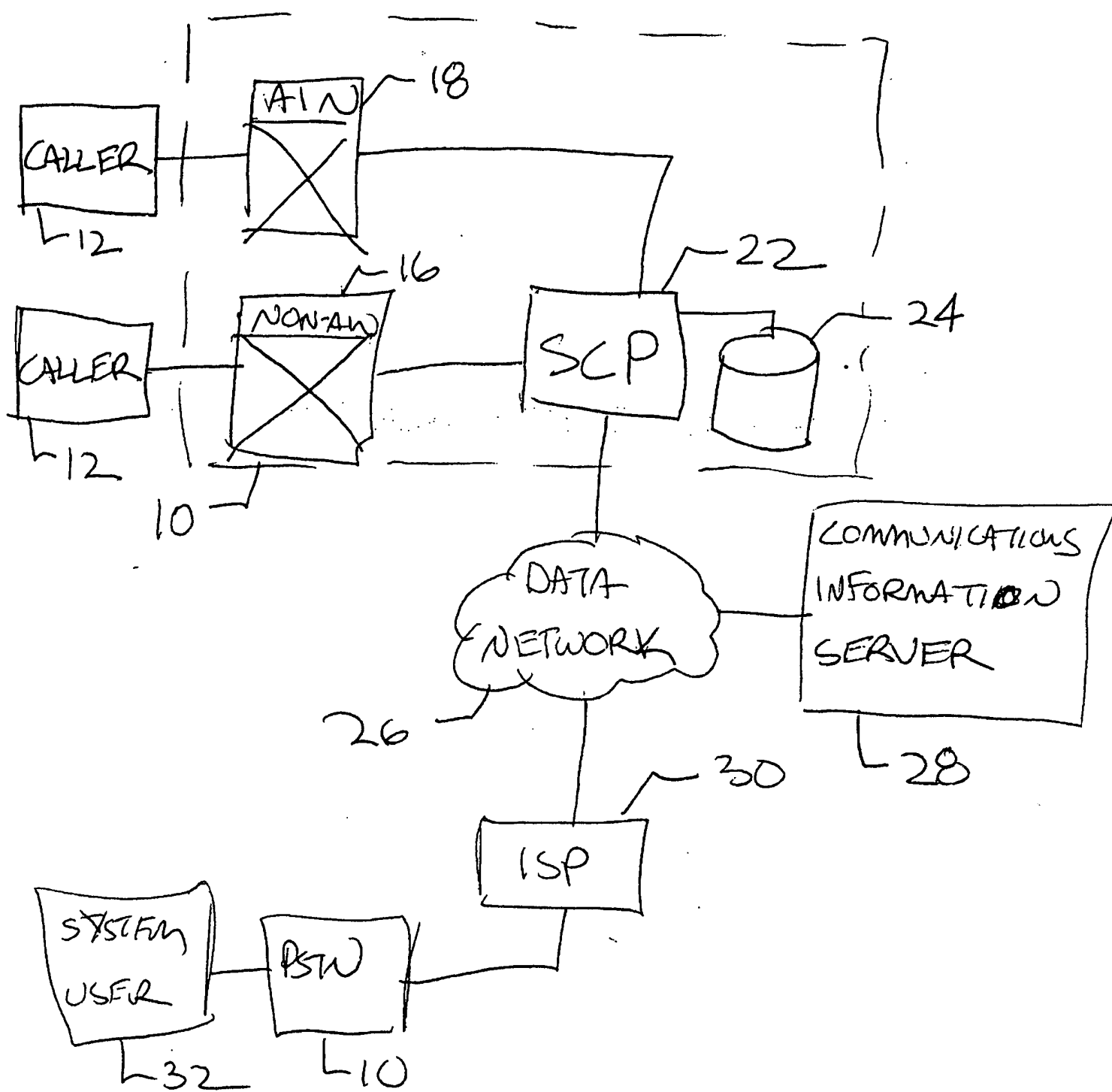


FIG. 1

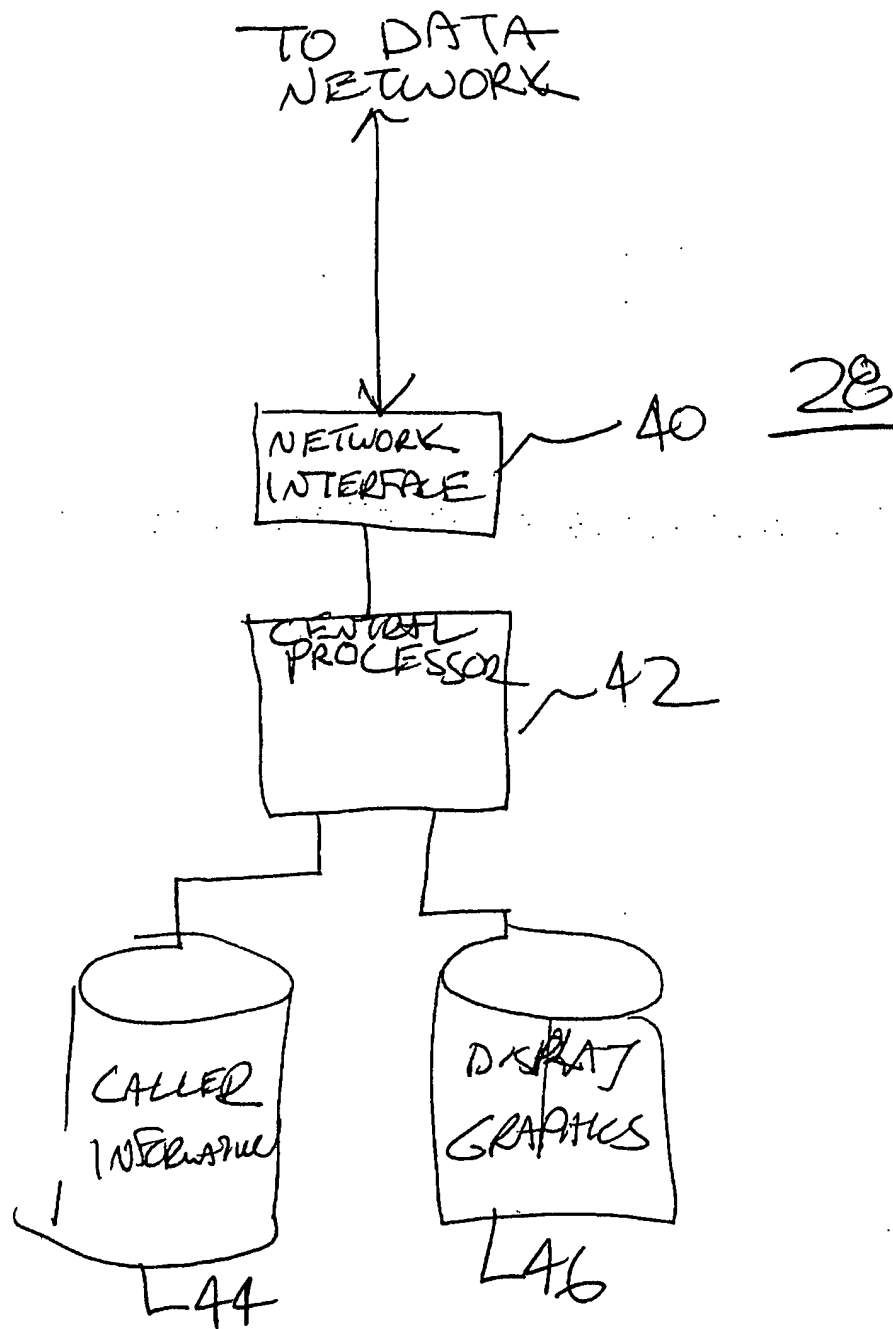


FIG. 2

## APPENDIX 2

APPENDIX 2 gives a detailed view of the database that carries the routing and time zone information.

### SUBSCRIBER Table:

This table stores subscriber information.

The part of the Icon Address field within brackets represents the country code. This is needed because two subscribers from two different countries may have the same phone number.

This table is created as part of offering the DirectoryTalk service.

Subscriber Name	Login ID	Password	Subscriber Country	Time Zone	Icon Type	Icon Address
John Doe1	johndo1	XXXXXXXX	USA	MDT	Work Phone, Home Phone, Numeric Pager, Toll-free Number, Cellular Phone, Voice Mail, Video Phone, E-mail	(1) 303-896-1000, (1) 303-788-1000, (1) 303-821-7889, (1) 1-800-345-2222, (1) 303-435-5565, (1) 303-896-3333, (1) 303-896-4444, jdoe1@abcinc.com
John Doe2	johndo2	XXXXXXXX	India	IST	Home Phone, Cellular Phone, Home Office, Voice Mail, Home Fax, Desktop Data Conferencing, Desktop Video Conferencing, E-mail	(91) 44-233-2121, (91) 44-288-2122, (91) 44-233-2123, (91) 44-234-2100, (92) 44-233-2125, jdoe2@data.xyzinc.com, jdoe2@video.xyzinc.com, jdoe2@xyzinc.com

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DATE INFO:

This table stores information relating to the date-based routing criteria. Travel dates are up to 6 months into the future are allowed to be added to the table. On the first day of each month, the system will purge entries that are two months old. In other words, the system will only keep travel dates for the previous month and those for the next 6 months.

~ 62 ~ 64 ~ 66 ~ 68 ~ 70 ~ 72 ~ 74

Address	Type	Travel Date	Visiting Country	Visiting Country Time Zone	Routing Address	Routing Address Type
(1) 303-896-1000, (1) 303-788-1000, (1) 303-435-5565	Work Phone, Home Phone, Cellular Phone	10/15/1998	USA	EST	(1) 201-741-1000	Work Phone
(1) 303-821-7889	Numeric Pager	10/15/1998	USA	EST	(1) 201-821-1230	Numeric Pager
(1) 1-800-345-2222	Toll-free Number	10/15/1998	USA	EST	(1) 1-888-233-2456	Toll-free Number
(1) 303-896-1000, (1) 303-788-1000, (1) 303-435-5565	Work Phone, Home Phone, Cellular Phone	10/16/1998	USA	EST	(1) 201-695-1230	Cellular Phone
(1) 303-821-7889	Numeric Pager	10/16/1998	USA	EST	(1) 201-821-1230	Numeric Pager
(1) 1-800-345-2222	Toll-free Number	10/16/1998	USA	EST	(1) 1-888-233-2456	Toll-free Number
(1) 303-896-1000, (1) 303-788-1000, (1) 303-435-5565	Work Phone, Home Phone, Cellular Phone	10/30/1998	France	FST	(22) 12-345-3456	Work Phone
(1) 303-821-7889	Numeric Pager	10/30/1998	France	FST	(22) 12-451-3230	Numeric Pager
(1) 1-800-345-2222	Toll-free Number	10/30/1998	France	FST	(22) 1-800-333-2444	Toll-free Number
(91) 44-233-2121, (91) 44-288-2122, (91) 44-233-2123, (91) 44-234-2100	Home Phone, Cellular Phone, Home Office, Voice Mail	12/10/1998	S. Korea	KST	(31) 77-478-9999	Cellular Phone
(91) 44-233-2124	Home Fax	12/10/1998	S. Korea	KST	(31) 77-478-9980	Work Fax
(91) 44-233-2121, (91) 44-288-2122, (91) 44-233-2123, (91) 44-234-2100	Home Phone, Cellular Phone, Home Office, Voice Mail	12/11/1998	Singapore	SST	(20) 15-345-1234	Work Phone
(91) 44-233-2124	Home Fax	12/11/1998	Singapore	SST	(20) 15-345-1230	Work Fax
(91) 44-233-2121, (91) 44-288-2122, (91) 44-233-2123, (91) 44-234-2100	Home Phone, Cellular Phone, Home Office, Voice Mail	12/30/1998	Australia	EST	(81) 441-456-9834	Voice Mail
(91) 44-233-2124	Home Fax	12/30/1998	Australia	EST	(81) 441-456-9824	Work Fax

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FIG. 4

# TIME OF DAY Table:

This table stores information relating to the time-of-day based routing criteria.

Destination Address	Destination Type	Day	Time Interval	Routing Address	Routing Address Type
(1) 303-896-1000, (1) 303-435-5565, (1) 303-896-4444	Work Phone, Cellular Phone, Video Phone	Sunday	12:01 AM - 12 Mid Night	(1) 303-896-3333	Voice Mail
(1) 303-896-1000, (1) 303-435-6656, (1) 303-896-4444	Work Phone, Cellular Phone, Video Phone	Monday	12:01 AM - 8 AM	(1) 303-896-3333	Voice Mail
(1) 303-788-1000	Home Phone	Monday	8:01 AM - 5 PM	(1) 303-896-1000	Work Phone
(1) 303-788-1000	Home Phone	Monday	5:01 PM - 7 PM	(1) 303-435-6656	Cellular Phone
(1) 303-896-1000, (1) 303-788-1000, (1) 303-435-5565, (1) 303-896-4444	Work Phone, Home Phone, Cellular Phone, Video Phone	Monday	10:01 PM - 12 Mid Night	(1) 303-896-3333	Voice Mail
(1) 303-896-1000, (1) 303-435-6656, (1) 303-896-4444	Work Phone, Cellular Phone, Video Phone	Tuesday	12:01 AM - 8 AM	(1) 303-896-3333	Voice Mail
(1) 303-788-1000	Home Phone	Tuesday	8:01 AM - 5 PM	(1) 303-896-1000	Work Phone
(1) 303-788-1000	Home Phone	Tuesday	5:01 PM - 7 PM	(1) 303-435-6656	Cellular Phone
(1) 303-896-1000, (1) 303-788-1000, (1) 303-435-5565, (1) 303-896-4444	Work Phone, Home Phone, Cellular Phone, Video Phone	Tuesday	10:01 PM - 12 Mid Night	(1) 303-896-3333	Voice Mail
(1) 303-896-1000, (1) 303-435-6656, (1) 303-896-4444	Work Phone, Cellular Phone, Video Phone	Wednesday	12:01 AM - 8 AM	(1) 303-896-3333	Voice Mail
(1) 303-788-1000	Home Phone	Wednesday	8:01 AM - 5 PM	(1) 303-896-1000	Work Phone
(1) 303-788-1000	Home Phone	Wednesday	5:01 PM - 7 PM	(1) 303-435-6656	Cellular Phone
(1) 303-896-1000, (1) 303-788-1000, (1) 303-435-5565, (1) 303-896-4444	Work Phone, Home Phone, Cellular Phone, Video Phone	Wednesday	10:01 PM - 12 Mid Night	(1) 303-896-3333	Voice Mail
(1) 303-896-1000, (1) 303-435-6656, (1) 303-896-4444	Work Phone, Cellular Phone, Video Phone	Thursday	12:01 AM - 8 AM	(1) 303-896-3333	Voice Mail
(1) 303-788-1000	Home Phone	Thursday	8:01 AM - 5 PM	(1) 303-896-1000	Work Phone
(1) 303-788-1000	Home Phone	Thursday	5:01 PM - 7 PM	(1) 303-435-6656	Cellular Phone
(1) 303-896-1000, (1) 303-788-1000, (1) 303-435-5565, (1) 303-896-4444	Work Phone, Home Phone, Cellular Phone, Video Phone	Thursday	10:01 PM - 12 Mid Night	(1) 303-896-3333	Voice Mail
(1) 303-896-1000, (1) 303-435-6656,	Work Phone, Cellular Phone,	Friday	12:01 AM - 8 AM	(1) 303-896-3333	Voice Mail

This table stores information relating to the unavailability of different types of pager owned by a subscriber.

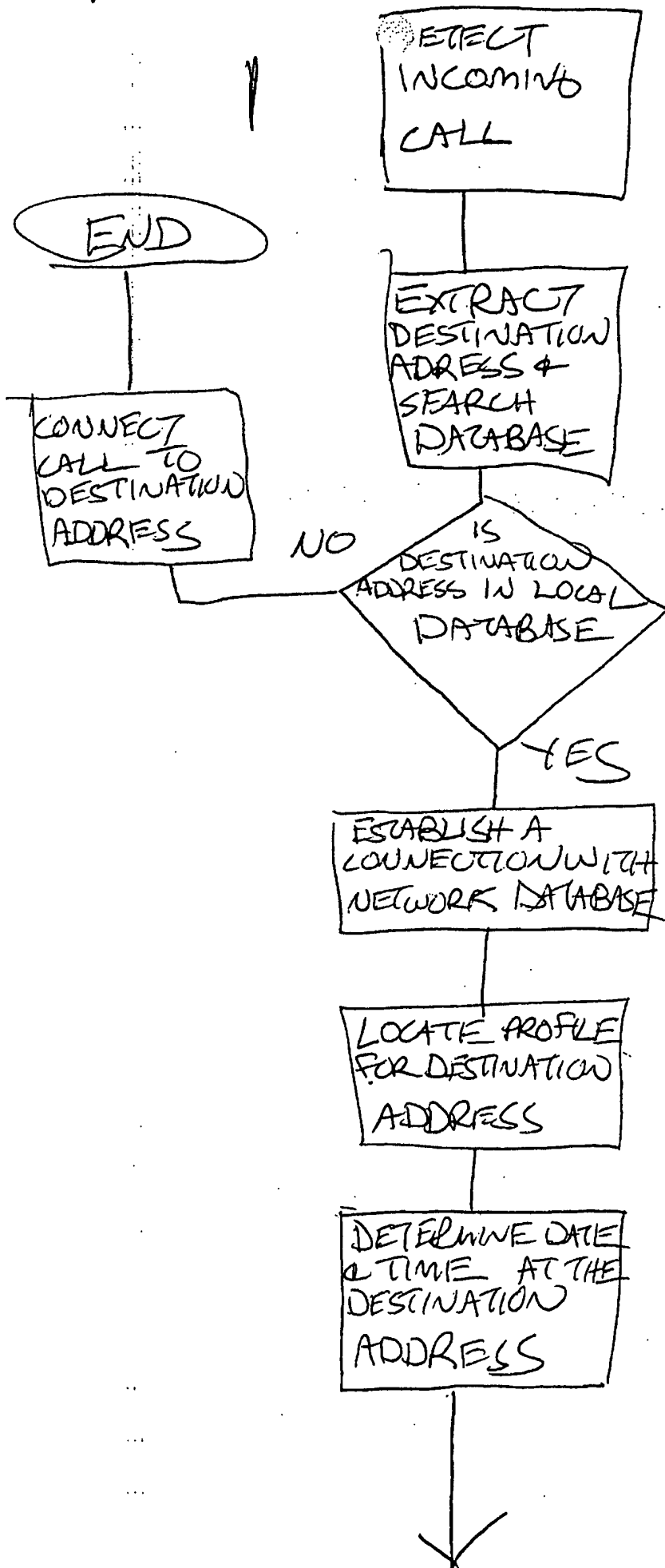
102 106 108

110

Destination Address	Icon Type	Day	Time Interval
(1) 303-821-7889	Numeric Pager	Sunday	12:01 AM - 12 Mid Night
(1) 303-821-7889	Numeric Pager	Monday	12:01 AM - 8 AM
(1) 303-821-7889	Numeric Pager	Monday	10:00 PM - 12 Mid Night
(1) 303-821-7889	Numeric Pager	Tuesday	12:01 AM - 8 AM
(1) 303-821-7889	Numeric Pager	Tuesday	10:00 PM - 12 Mid Night
(1) 303-821-7889	Numeric Pager	Wednesday	12:01 AM - 8 AM
(1) 303-821-7889	Numeric Pager	Wednesday	10:00 PM - 12 Mid Night
(1) 303-821-7889	Numeric Pager	Thursday	12:01 AM - 8 AM
(1) 303-821-7889	Numeric Pager	Thursday	10:00 PM - 12 Mid Night
(1) 303-821-7889	Numeric Pager	Friday	12:01 AM - 8 AM
(1) 303-821-7889	Numeric Pager	Friday	10:00 PM - 12 Mid Night
(1) 303-821-7889	Numeric Pager	Saturday	12:01 AM - 8 AM
(1) 303-821-7889	Numeric Pager	Saturday	10:00 PM - 12 Mid Night

100

FIG. 6



7a

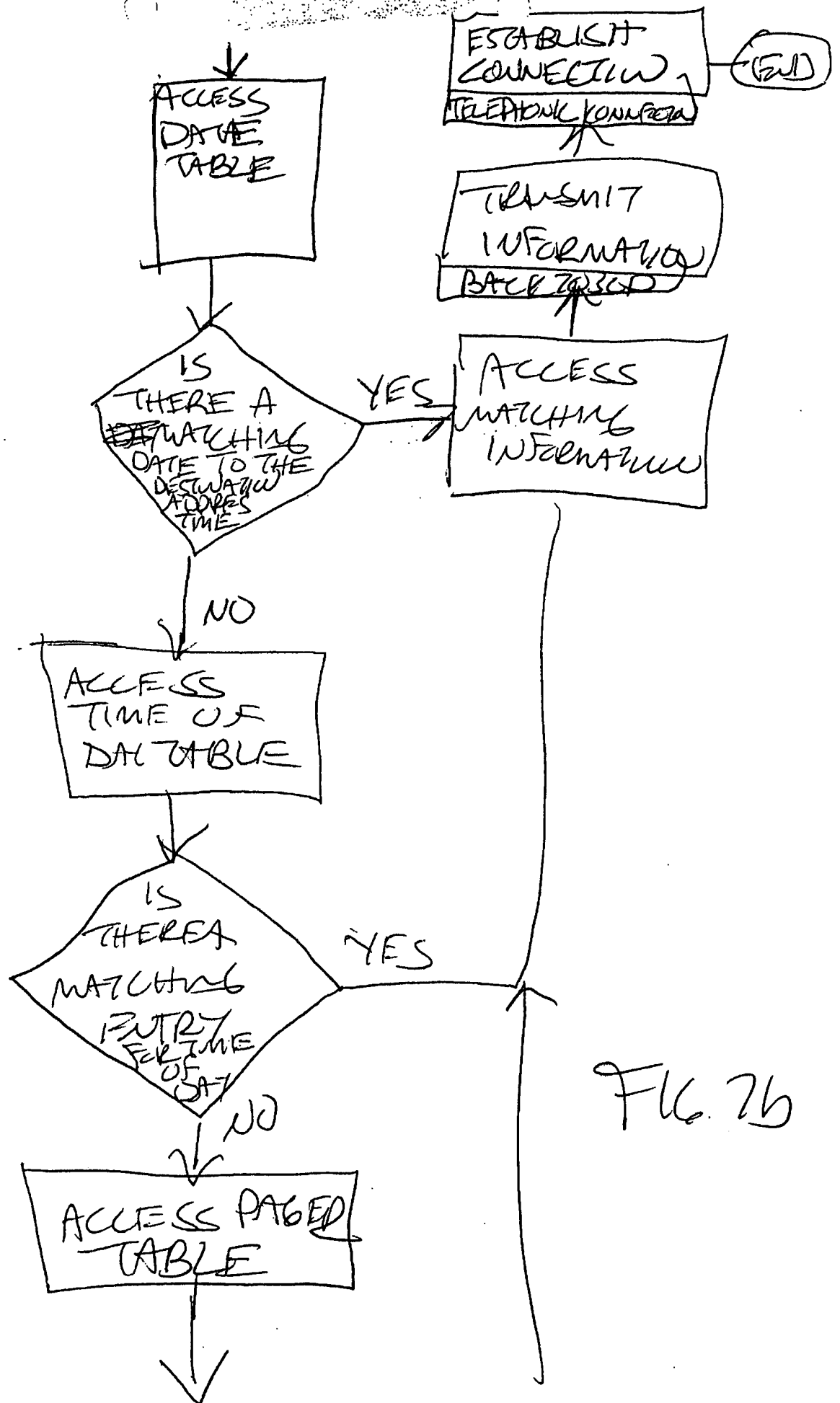
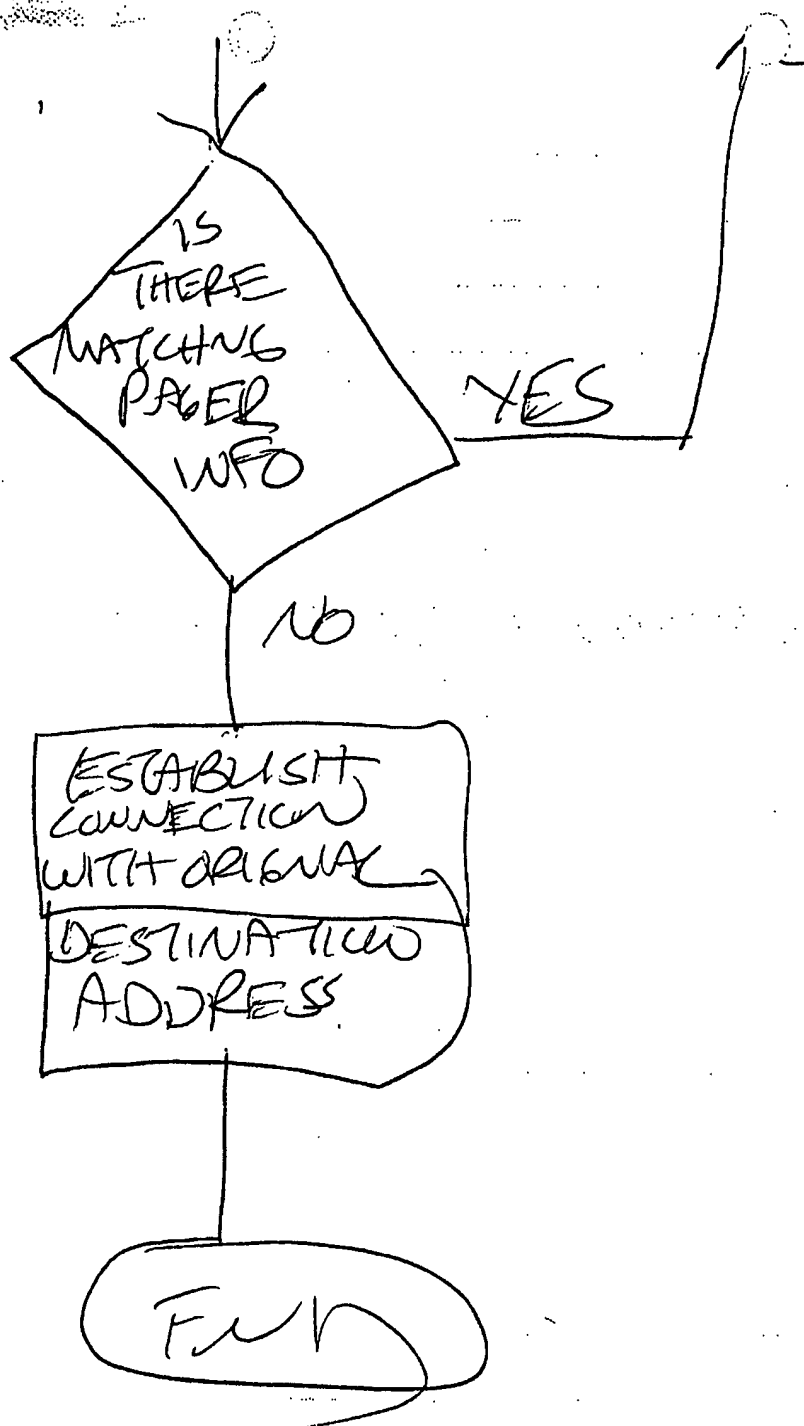


FIG. 26



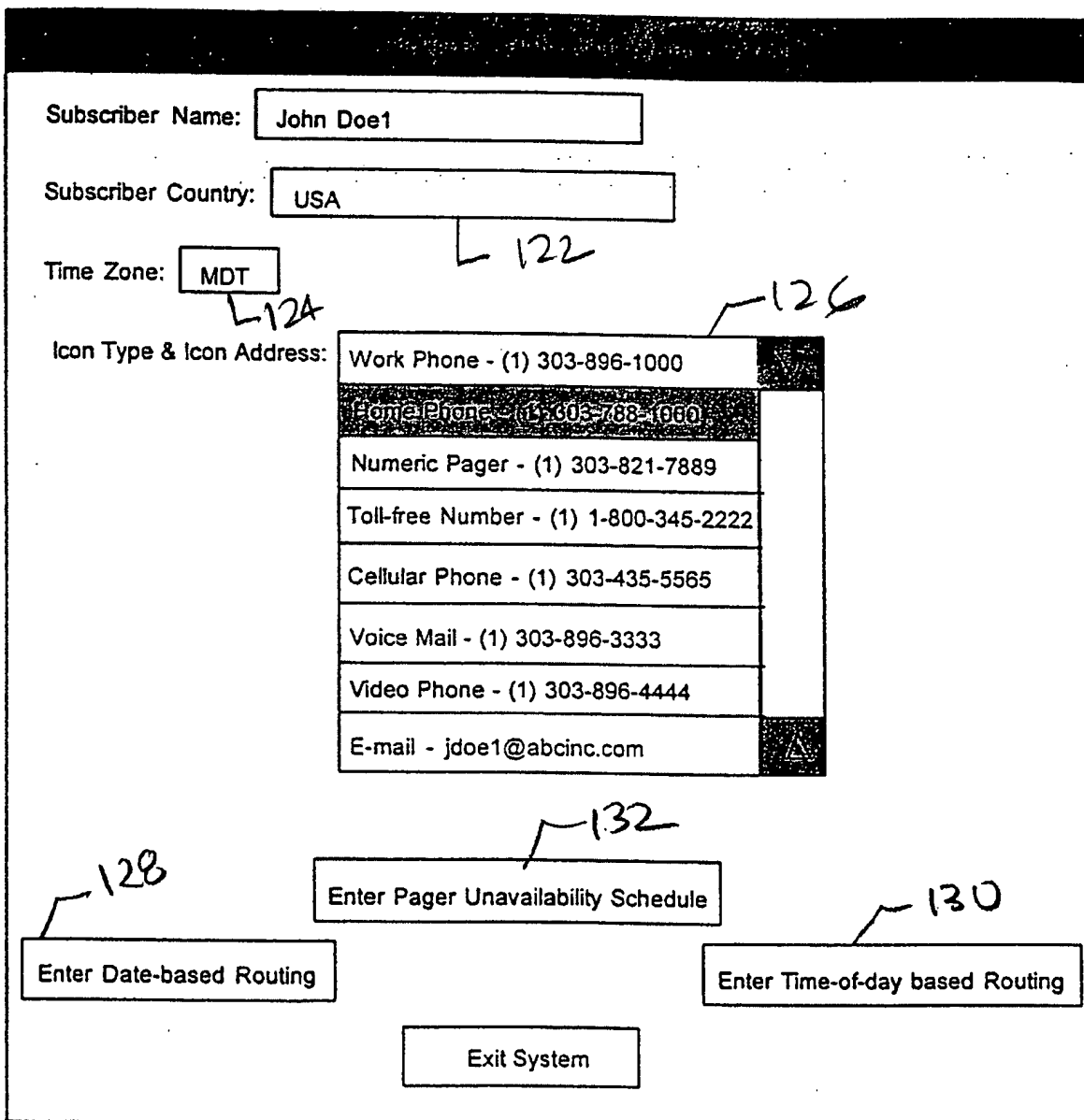


F16.7c

## Intelligent Call Routing System Functions screen

This screen lets the subscriber invoke the system functions.

This screen is shown after the subscriber logs into the system via the "Welcome to the Intelligent Call Routing system" screen.



The screenshot shows a web interface for a subscriber named John Doe1. The interface includes fields for Subscriber Name, Country, Time Zone, and a list of contact methods. Handwritten annotations include "122" pointing to the Country field, "124" pointing to the Time Zone field, "126" pointing to the contact methods list, "128" pointing to the "Enter Date-based Routing" button, "132" pointing to the "Enter Pager Unavailability Schedule" button, "130" pointing to the "Enter Time-of-day based Routing" button, and "120" pointing to the "Exit System" button. A circled "18" is also present at the bottom.

Subscriber Name: John Doe1

Subscriber Country: USA

Time Zone: MDT

Icon Type & Icon Address:

Work Phone - (1) 303-896-1000	
Home Phone - (1) 303-788-1000	
Numeric Pager - (1) 303-821-7889	
Toll-free Number - (1) 1-800-345-2222	
Cellular Phone - (1) 303-435-5565	
Voice Mail - (1) 303-896-3333	
Video Phone - (1) 303-896-4444	
E-mail - jdoe1@abcinc.com	

Enter Date-based Routing

Enter Pager Unavailability Schedule

Enter Time-of-day based Routing

Exit System

## Enter Date-based Routing screen

This screen allows the subscriber to add date-based routing of calls to the database. It is assumed that the dates entered by the subscriber reflect his/her availability away from the normal place of residence. In other words, the subscriber is assumed to be traveling outside (either within the subscriber's home country or in a foreign country) the normal place of residence on the date(s) entered.

This screen is shown after the subscriber selects the "Enter Date-based Routing" button on the "Intelligent Call Routing System Functions" screen.

Icon Type: Home Phone 142

Icon Address: (1) 303-788-1000 144

Routing Table Section:
 

148
150
152
154
156

Travel Date	Visiting Country	Visiting Country Time Zone	Destination Address	Destination Address Type
10/15/1998	USA	EST <input checked="" type="checkbox"/>	201-741-1000	Home Phone <input checked="" type="checkbox"/>
		CST		Work Phone
		MST		Cellular Phone
		PST		Voice Mail
		HST		
10/16/1998	USA	EST <input checked="" type="checkbox"/>	201-695-1230	Home Phone <input checked="" type="checkbox"/>
		CST		Work Phone
		MST		Cellular Phone
		PST		Voice Mail
		HST		
10/30/1998	France	EST <input checked="" type="checkbox"/>	12-345-3456	Home Phone <input checked="" type="checkbox"/>
		CST		Work Phone
		MST		Cellular Phone
		PST		Voice Mail
		HST		

OK
Add a Row
CANCEL

L 140

FLC. 9



## Enter Pager Unavailability Schedule screen

This screen allows the subscriber to add information to the database relating to the unavailability of pager(s) that a subscriber may use.

This screen is shown after the user selects the "Enter Pager Unavailability Schedule" button on the "Intelligent Call Routing System Functions" screen.

Subscriber Country:

Icon Type:

Time Zone:

Icon Address:

Routing Table Section:

Day		Time Interval
Sunday		12:01 AM - 12 Mid Night
Monday		
Tuesday		
Wednesday		
Thursday		
Monday		12:01 AM - 8 AM
Tuesday		
Wednesday		
Thursday		
Friday		

L190

FIG. 11

Holme Roberts & Owen LLP

October 8, 1999



Thiru Srinivasan  
9675 South Red Oakes Place  
Highlands Ranch, Colorado 80126

Re: "INTELLIGENT CALL ROUTING SYSTEM"  
Our File No.: 42059-00970  
U S WEST Docket No.: 1613

*Kenneth J. Johnson*  
(303)866-0639  
[johnsok@hro.com](mailto:johnsok@hro.com)

Dear Thiru:

Enclosed is the above-identified patent application for your review. Please review the application to assure that it properly and accurately describes the invention as originally disclosed in your Invention Disclosure Sheet. Please make your changes (if any) on the enclosed application and when you are finished, please call me at 866-0639 so we may discuss this application further.

*Attorneys at Law*

*1700 Lincoln Street  
Suite 4100  
Denver, Colorado  
80203-4541  
Tel (303)861-7000  
Fax (303)866-0200  
[www.hro.com](http://www.hro.com)*

*Denver  
Salt Lake City  
Boulder  
Colorado Springs  
London*

While reviewing the application, keep in mind that the claims must particularly point out and distinctly claim the subject matter of the invention, so it is important that you review them very carefully. The claims attempt to cover the invention in its broadest aspects and also more specifically. The broadest claims should represent only the essential features of the invention. Review these claims for any element which could be eliminated without losing the essence of the invention. The remaining claims, in different degrees, are more limited, i.e., they contain additional elements. Check for limitations which are completely unrelated to the inventive concept, as well as additional limitations which should be included.

I am enclosing along with this application, the Declaration and Assignment for your execution if there are no further revisions to the application. As always, please execute where indicated and have a notary sign the Assignment.

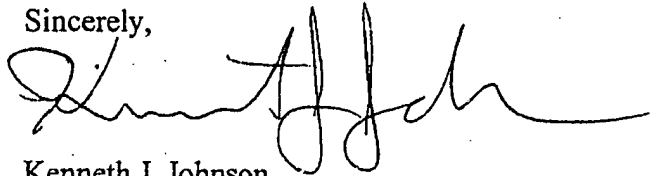
*Please remember that this application is Confidential and Proprietary and must be treated accordingly. It should be secured at night and adequately protected during the day.*

Holme Roberts & Owen LLP

Thiru Srinivasan  
October 8, 1999  
Page 2

I have enclosed a self-addressed stamped envelope for your convenience. If you have any questions please do not hesitate to contact me.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Kenneth J. Johnson', with a long horizontal flourish extending to the right.

Kenneth J. Johnson

Enclosures

Holme Roberts & Owen LLP

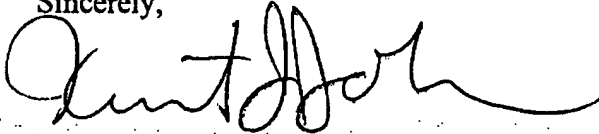
Thiru Srinivasan

August 4, 1999

Page 2

If you have any questions please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ken Johnson', written over a horizontal line.

Kenneth J. Johnson

Enclosures



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